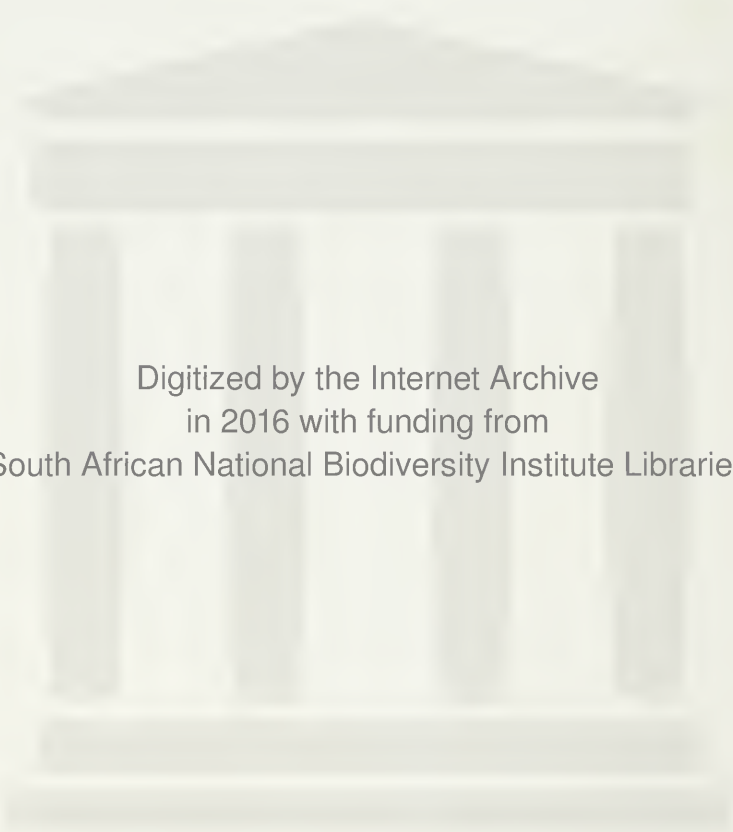


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THE ANNALS
OF THE BOLUS HERBARIUM

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University of Cape Town

THE ANNALS
OF THE
BOLUS HERBARIUM

EDITED BY
H. M. L. BOLUS, B.A.
HON. CURATOR, BOLUS HERBARIUM

VOLUME III
WITH NINE PLATES AND TWO PORTRAITS

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NOVITATES AFRICANAE

Diosma Marlothii, Dummer. *D. obtusifoliae* affinis sed parce ramosa, et foliis carnosulis, numquam ovatis, marginibus carinaque haud rigide ciliolatis, floribus saepe 2- vel 3-natis, calycibus petalisque majoribus differt.

Fruticulus parceramosus, ad 0·3 m. altus, ramis fastigiatis atrobrunneis, ramulis florentibus brevibus minute puberulis; folia opposita, decussata, ascendentia, inferne adpressa, interdum subimbricata, lanceolata vel oblonga, apice subacuta vel obtusiuscula, circiter 3 mm. longa, 1-1·5 mm. lata (raro 6 mm. longa et 1 mm. lata), carnosula, supra concava, nitentia, dorso obtuse carinata vel convexiuscula, 6—5-punctato-glandulosa, utrinque minute puberula, margine minute pectinato-ciliolatae; flores 1—3-nati, carnei (in sicco), perbrevis pedicellati, ramulos terminantes, pedicellis glabris; calyx circ. 3 mm. longus, subscariosus, segmentis late deltoideis, subacute cuspidatis, e basi 2 mm. latis, utrinque glabris, dorso obtuse carinatis, marginibus hyalinis, pectinato-pilosulis; petala perbrevis unguiculata, 6 mm. longa, 3—4 mm. lata, limbis late obovatis, rotundatis, utrinque glabris dorso punctato-glandulosi; stamina (5), minuta, in toto 1·5 mm. longa, glabra, antheris glandula magna deltoidea atropurpurea terminata; pistillum ignotum.

Cape Province: probably on the Matroosberg, *R. Marloth*, 7949.

This description is based on five specimens in Dr Marloth's Herbarium, without exact particulars as to place or date of collection. Its nearest ally appears to be *D. obtusifolia*, Sonder (based on Drege, 7144, Herb. Sonder, also without particulars as to place of collection, and not represented in S.A. Herbaria), from which it differs in its sparingly branching habit, the fleshy (never ovate) leaves without the rigid ciliation of their margins and keels, the flowers often in pairs and threes, and the larger calyces and petals. (Pl. I, D.)

Barosma Bathii, Dummer. *B. crenatae* affinis sed ramulis petiolisque pubescentibus, foliis magis ellipticis, minus coriaceis, saepissime perpaucis magnis glandulis praeditis, staminodiis stylisque glaberrimis, ceterisque differt.

Frutex unimetricus vel altior, parceramosus, ramis ascendentibus; ramulis pallide brunneis, patenter albo-pubescentibus; folia perbrevis petiolata, ascendentia, demum patula, internodiis aequilonga vel duplo longiora, elliptica, obtusa, 1·3—3 cm. longa, 7 mm.—1 cm. lata,

tenuiter coriacea, pallide viridia, supra vix nitentia, subtus pallidiora, elevato-costata, glandulis paucis, magnis, conspersa vel interdum fere eglandulosa, margine grosse denticulato-crenulata, basin versus minute ciliolata, petiolo complanato, puberulo; cymae axillares, 1—5-florae, racemoso-dispositae, pedunculis 0.5—1.5 cm. longis puberulis, apicem versus 2—3-bracteatis, bracteis verticillatis, foliosis; bracteolae basillares, vel medio positae, parvulae, ellipticae, rotundatae, 0.5—0.7 mm. longae, dorso convexae, ciliolatae; flores albae (sicco); pedicelli crassiusculi, 2—4 mm. longi, minute puberuli; calyx utrinque glaber viridisque, segmentis late ovatis, obtusis vel rotundatis, circ. 1 mm. longis dorso obtuse lato-carinatis, marginibus ciliolatis; petala sessilia, obovato-cuneata, rotundata, 4—5 mm. longa, 2 mm. lata, utrinque glabra, dorso purpureo, 2—4-punctato-glandulosa; stamina circ. 5 mm. longa, glaberrima; staminodia anguste-oblonga, apice purpureo-recurva, circ. 2 mm. longa, glabra; pistillum ubique glabrum, stylo filiformi, 3 mm. longo.

Cape Province: South-Western Region; Clanwilliam Div., Cedarberg Mountains, Forster *Bath* (Herb. Bolus, No. 15691).

A very interesting novelty among *Buchus*, the above description being based on material collected by Forester Bath and communicated by the Forestry Department in Oct., 1917.

Its relationship is with *B. crenata*, Kunze (*B. crenulata*, Lindley) from which it is at once distinguished by its hairy twigs and petioles, the more elliptic less coriaceous texture of the leaves, which are occasionally epunctate dorsally, more often with a few large scattered glands, the distant and more rough crenulation of their margins, in the relatively smaller flowers, differently disposed, in the petals markedly gland-dotted dorsally, and in the totally glabrous staminodes and styles.

The large size of the shrub and its large leaves suggest commercial possibilities, although the leaves do not possess many glands to the square inch. On the other hand pharmacologists assert that it is not merely the oil content of the leaves but also their mucilaginous properties, which give to them their intrinsic value. It is a species worth taking up experimentally, and every effort should be made to secure a fair quantity of the leaves and these submitted to careful analysis.

Lebeckia elongata, Hutchinson (*Leguminosae-Genisteae*); affinis *L. spinescenti*, Harv., et *L. microphyllae*, E. Mey., ab illa ramulis elongatis minus spinescentibus, ovario dense pubescente, ab hac petiolis multo longioribus differt.

Suffrutex laxè divaricatus, subdichotome ramosus; rami leviter costati, straminei; ramuli elongati, cinerei, graciles, laxissime foliati,

appresse sericeo-pubescentes, superne defoliati sed vix spinescentes; folia trifoliolata, longe petiolata; foliola sessilia, lineari-oblanco-lata, subobtusata, 5—8 mm. longa, circiter 1.76 mm. lata, coriacea, appresse sericeo-pilosa; petioli plerumque circiter 1 cm. longi, subteretes, appresse pilosi, circiter 0.5 mm. crassi; flores pauci, apices ramulorum versus dispositi; pedicelli circiter 3 mm. longi, minute appresse pubescentes. Calyx 6 mm. longus; tubus late obconicus, minute appresse pubescens, lobis 5, subaequalibus, lineari-triangularibus, fere 2 mm. longis, parce pubescentibus. Corolla 1.2 cm. longa, alis vexillo et carina subaequalia brevioribus; ovarium hirtum; fructus non visus.

South West Africa. *H. H. W. Pearson* (Percy Sladen Mem. Exped. 1915–16, No. 9899).

This species is allied to *Lebeckia spinescens*, Harv., from which it differs in the usually longer and scarcely spinescent branchlets and very hairy ovary (and legume?). In the hairy ovary it resembles *L. microphylla*, E. Mey., but it may be at once distinguished from that species by its long petioles.

Dolichos Pearsonii, Hutchinson (*Leguminosae-Phaseoleae*); syn. *Dolichos Lablab*, var. *rhomboideus*, Schinz in Abh. Bot. Ver. Brand. xxx, 168 (1888), non *D. rhomboideus*, G. Hoffm.; affinis *D. Lablab*, Linn., et *D. gibbosus*, Thunb., ab illo foliolis multo minoribus terminale hastato, leguminibus minoribus, ab hoc foliolis minoribus et leguminibus latioribus facile distinguitur.

Caules graciles laxe foliati, subscandentes (?) pilis brevissimis reflexis parce pubescentes. Folia trifoliolata, 3—5 cm. longa, usque ad 5 cm. lata, glabra vel parce puberula; foliolum terminale basi hastatum et truncatum vel brevissime et late cuneatum, foliolis lateralibus uno latere rotundato-hastatis, nervis utrinque conspicue elevatis; petioli circiter 1 cm. longi, graciles, parce puberuli; stipulae oblongo-ovatae, subacutae, circiter 2.5 mm. longae, extra conspicue nervosae, puberulae; stipellae oblongo-lineares, acutae, glabrescentes, 2 mm. longae; petioluli stipellis paullo breviores, minute setuloso-pubescentes. Racemi terminales, laxissime pauciflori; bracteae subdeciduae, stipulis plus minusve similes; pedicelli (in fructu) vix 2 mm. longi; bracteolae binae, calyci adpressae, late obovatae, 3 mm. longae, dorso trinervatae, margine membranaceae, glabrae. Calyx bilabiatus, 6 mm. longus, glaber, lobis 2 adaxialibus fere ad apicem connatis, abaxialibus 3 liberis, anguste triangularibus, subacutis. Vexillum late orbiculare, 1.5 cm. longum, 1.7 cm. latum, basi appendice lato, apice bidentato, instructum; alae oblongo-obovatae, 1.8 cm. longae, 1 cm. latae, ungue 7 mm. longo; carina fere 2 cm. longa, acuta. Fructus compressus, ambitu oblique oblongo-oblanco-latus, stylo uno latere hirsuto, persistente, longe

rostratus, 4 cm. longus, 1.8 cm. latus, marginibus incrassatis, muricatis. Semina immatura nitida, ellipsoidea.

South West Africa. Amboland: Oshando, *H. Schinz* (1886). Between Nauchas and Areb, on granite at banks of stream, corolla purple-blue, 3rd Jan., 1916, *H. H. W. Pearson* (Percy Sladen Memorial Expedition, No. 9019).

This is a very distinct species from the common and well known *Dolichos Lablab*, Linn. It differs from *D. Lablab* especially by the very slender stems, small hastate leaflets and smaller flowers and bracts. The fruits of the two species are very similar, but in our plant much smaller.

Caesalpinia Pearsonii, L. Bolus (*Leguminosae-Caesalpinioideae*); species foliis minimis bipinnatis, pinnis tribus, quasi digitatis, leguminibus valde falcatis aculeatis insignis.

Suffrutex rigidus, 15—40 cm. altus; rami patentes vel adscendentes, subteretes, spinellis sparsis, demum valde recurvis, validis, basi 0.3 cm. diam., armati, juniores adpresse argenteo-pubescentes, seniores glabrescentes, cortice pallido vel brunneo, ad 0.6 cm. diam.; folia patentia vel saepius reflexa, sessilia, stipulis binis vel saepe tertio interjecto, basi concretis, spinescentibus, 0.3 cm. longis, 2-pinnata, 0.7—1.7 cm. longa, pinnis tribus, quasi digitatis, 5—8-jugatis, foliolis oppositis, sat crebris, ovalibus, obtusis vel subacutis, argenteo-sericeis, 0.3—0.4 cm. longis; flores paniculati, panícula parce ramosa, ramis brevibus aculeatis; bracteae mox deciduae, argenteo-sericeae, vix 0.2 cm. longae; pedicelli rarius ad 0.2 cm. longi; calyx argenteo-sericeus, 0.5 cm. longus, segmentis erectis subovatis vel anteriore obovato-oblongo, tubo fere duplo longioribus; petala flava, 0.9 cm. longa, breviter unguiculata, apice fere truncata, delicatule undulata, anteriora 0.2 cm., lateralia 0.3 cm., posterius 0.4 cm. lata; filamenta dimidio inferiore ciliata, petala parum excedentia, inter se inaequilonga, antheris ovatis apiculatis; ovarium stipitatum setosum 2-ovulatum, stigmatibus concavo, margine ciliato; legumen indehiscens planum falcatum rubescens aculeatum, aculeis atro-rubris, 2.3 cm. longum, 1.5 cm. latum, semine unico plano, 0.8 cm. longo latoque.

South-West Africa; Ababes, breccia banks of the Tsondeb River, below farm, Dec. 29, 1915, *H. H. W. Pearson* (Percy Sladen Memorial Expedition, No. 9162).

There is no other *Caesalpinia* at all like this amongst the old-world examples of the genus, and the habit is equalled only by certain of the microphyllous West Indian and South American species. (Pl. I, B.)
Mesembrianthemum caespitosum, L. Bolus (*Ficoideae-Mesembriceae*) epapulsum perenne caulescens, ramis elongatis prostratis caespitosis foliosis,

foliis basi tantum subconnatis, 3-quetris; floribus solitariis, meridie expansis, 5-meris; petalis roseis; staminibus confertis; stylis filiformibus, demum stamina parum superantibus.

Herba glaberrima ramosissima, ramis caespitosis gracilibus, ramulis floriferis adscendentibus vel erectis; folia patentia vel adscendentia, subfalcata, supra dimidium latissima, acute triquetra, acuta, basin versus complanata, glauca, 1 cm. longa vel ultra, ad 0.2 cm. diam. lataque; pedunculus teretis gracilis, ad 1 cm. longus; flores ad 2.2 cm. diam., sed saepissime minores; calyx obconicus, segmentis fere aequalibus, vel duobus longioribus, ovato-lanceolatis acutis, 0.4—0.6 cm. longis; petala subbiseriata, spathulata, ad 0.9 cm. longa, 0.3 cm. lata; staminodia perpauca; filamenta barbata viscida albida, apicem versus rosea, antherae luteae; discus annularis crenulatus, saturate viridis; ovarium supra convexum, stylis filiformibus, ad 0.5 cm. longis.

Cape Province: South-Western Region; Paarl Div., nr. Paarl, *J. Rohland* (National Botanic Gardens, No. $\frac{17112}{14}$).

An epaulose perennial caulescent herb, with elongate prostrate leafy branches forming a dense mat; leaves somewhat connate at the base only, 3-quetrous; flowers solitary, open during the middle of the day, 5-parted; petals rose-pink; stamens collected; styles filiform, when mature slightly longer than the stamens.

A distinct species which does not fit satisfactorily into any of the established sections of the genus. The caespitose habit, slender branches, scarcely falcate leaves, solitary flowers, broad petals and filiform styles exclude it from the section *Falcata* to which it seems most nearly allied. It is a free flowerer (Oct.—March), and during the last five years has done exceedingly well at Kirstenbosch where it completely covers a rather shaded bank—a lovely sight with its profusion of brilliantly shining pink flowers on a back-ground of grey-green leaves.

Mesembrianthemum Strubeniae, L. Bolus. Floribus similibus illis sectionis *Sarmentosa*, sed habitu erecto et foliis subacinaciformibus ab omnibus ceteris sectionis differt.

Fruticulus erectus ramosus robustus glaber, 75 cm. altus; rami compressi purpurascetes, internodiis folia excedentibus; folia breviter connata, matura subacinaciformia triquetra, lateraliter valde compressa, supra canaliculata vel plana, marginibus serrulatis, laete viridia, 4—6 cm. longa, 0.5—0.6 cm. lata, ad 1.2 cm. diam.; flores 5-meri, in cymas 2—3-ternatas dispositi, 3.2 cm. diam., omnes bracteati, bracteis basin calycis attingentibus vel parum brevioribus, 1.1—1.5 cm. longae; pedunculi 1.8—2.5 cm. longi; calycis tubus subcrateriformis, segmentis subaequalibus ovato-lanceolatis cauminatis, 0.6—0.9 cm.

longis; petala 2-seriata spathulato-linearia, saepius acuta, rosea, medio purpureo-nervata, ad 1.5 cm. longa, ad 0.2 cm. lata; stamina collecta, staminodiis circumdata, filamentis basin versus albis, superne purpureis, antheris albidis; discus annularis crenatus; ovarium supra convexum 5-lobum, 0.7 cm. diam.; styli subulati acuminati purpurei, 0.25 cm. longi.

Cape Province: South-Western Region; exact locality unknown. Flowered in Miss E. Struben's garden, Rosebank, nr. Cape Town, Sept., 1917. (Bolos Herbarium No. 14004.)

Described from living specimens. The flowers are exactly those of the section *Sarmentosa*, but the erect habit, and the strongly incurved leaves separate this from all the other species of the section. *Mesembrianthemum purpureostylus*, L. Bolus. *M. forficato* affine, sed habitu reptante, foliis longioribus, minus connatis, apice saepius obscure denticulatis, floribus minoribus, petalis obtusis vel subacutis differt.

Suffruticosum, caulibus elongatis reptantibus compressis alatis, 0.5—0.7 cm. diam., nodis incrassatis, cortice brunneo vel juniore purpureo, ramulis erectis; folia erecta, basi connata, triquetra, valde compressa, apice subtruncata, obscure denticulata vel integra, nitidula, olivaceo-viridia, ad 6.5 cm. longa, saepius 3—4 cm. longa, 0.9 cm. lata, 1.6 cm. diam.; flores solitarii 5-meri, meridie expansi, ad 3 cm. diam., pedunculati, pedunculo teretiusculo, infra medium 2-bracteato, ad 0.8 cm. longo; calyx turbinatus, segmentis subaequilongis ovatis obtusis, ad 0.8 cm. longis; petala lineari-oblongata roseo-purpurea, basin versus pallida, medio purpureo-vittata, 1.2 cm. longa; stamina staminodiaque conferta, filamentis pallidis, antheris purpureis; discus annularis denticulatus; ovarium supra valde convexum, stylis per brevibus triquetris acutis, capillis purpureis dense vestitis, vix 0.15 cm. longis.

Cape Province: South-Western Region; Swellendam Div., Bonny Vale, J. W. Mathews (National Botanic Gardens, No. $\frac{2426}{15}$).

Allied to *M. forficatum*, Linn., but differs by the creeping habit, longer leaves which are less connate at base, usually only obscurely denticulate at the apex, smaller flowers, and the obtuse or rarely subacute petals.

Described from living specimens which flowered freely in the National Botanic Gardens, Kirstenbosch, May—June, in 1917, 1918 and 1919.

Geigeria pilifera, Hutchinson (*Compositae-Inuleae*).

Radix erecta, simplex, dura, pallide brunnea, leviter striata, apicem versus circiter 1 cm. crassa. *Rami* dense conferti, usque ad 7 cm. longi, dense foliati, in latere superiore capitula axillaria sessilia contigua

gerentes, crispato-pilosi. Folia basi imbricata, longe petiolata, late oblanceolata vel obovato-oblanceolata, apice conspicue mucronata, basin versus sensim attenuata, 1.5—3 cm. longa, 1—1.5 cm. lata, mucronato-dentata, coriacea, utrinque crispato-pilosa et dense foveolata; petioli straminei, subulati, circiter 1.5 cm. longi, parce pilosi. *Capitula* axillaria, sessilia, circiter 1.3—1.5 cm. longa, inferne ovoidea, medio constricta, 0.5 cm. diametro. *Involucri bractee* purpurascens, 4—5-seriatae, apice in appendicem subulatam, 3—4 mm. longam attenuatae, parce pilosae. *Corollae tubus* anguste cylindricus, 5 mm. longus, parce puberulus; lobi lineares, acuti, 0.1 cm. longi, extra parce pubescentes. *Achaenia* anguste obovoidea, 0.3 cm. longa, albo-sericea. *Pappi squamae* 10, biseriatae, exteriores rotundatae, tenuissimae et hyalinae, apice undulato-dentatae, interiores in setam brevem scabridulam prolongatae.

South-West Africa: North of Aintsas, in sand, Dec., *H. H. W. Pearson* (Percy Sladen Memorial Expedition, No. 9240); between Tsondeb and Great Fish Rivers, on shale slopes, common, Dec., *id. (id. No. 9294)*.

This is a very distinct species with broader leaves than any described hitherto; the pappus scales when dry are remarkably thin and delicate as shown under a high power lens.

Helichrysum viscidissimum, Hutchinson (*Compositae-Inuleae*).

Planta circiter 18 cm. alta, multo ramosa, ramis dense albo-lanatis foliatis. *Folia* spatulato-oblanceolata, obtusa vel subacuta, ad basin longe attenuata, usque ad 1 cm. longa et 3 mm. lata, coriacea, utrinque glandulis breviter stipitatis dense viscidissima, 1-nervia. *Capitula* terminalia, solitaria, foliis superioribus suffulta, plus minusve campanulata, circiter 0.8 cm. longa. *Involucri bractee* parte superiore patulae vel recurvatae, albae, lanceolatae, acutae, extra inferne glandulosae, superne glabrae, interiores lineari-oblanceolatae, glabrae. *Flores* circiter 30; corollae tubus anguste cylindricus, glaber. *Achaenia* turgida, brevissima, glandulosa. *Pappi setae* numerosae, albae, corollas superantes, minute barbellatae.

South-West Africa: Naukluft Mts., below Goas, river-bed of ravine. Dec., *H. H. W. Pearson* (Percy Sladen Memorial Expedition, No. 9066).

This species belongs to the group *Leptolepidea*, Moeser (Engl. Jahrb. XLIV, 300), and appears to be most closely related to *H. ceras-tioides*, DC., differing in its densely glandular (not woolly) leaves and smaller capitula; another near ally is *H. spiciforme*, DC., with the capitula arranged in close leafy spikes.

Plumbago Pearsonii, L. Bolus (*Plumbagineae*), habitu *P. tristis*, Ait., sed facile distinguitur foliorum circumscriptione, calyce dissimili, ceterisque.

Fruticulus erectus subrigidus, 25—30 cm. altus, ramis virgatis

striatis, dense foliatis, cum foliis creberrime albo-lepidotis, vetustioribus subnudis, ad 0.2 cm. diam.; folia adscendentia vel fere erecta, obovato- vel oblanceolato-oblonga, basin versus attenuata quasi petiolata, basi auriculata, auriculis amplexicaulibus, obtusa, leviter undulata, ad 4 cm., saepius 2.5 cm. longa, 1 cm. lata; pedunculus brevissimus, saepius e basi 2-ramificatus, cum axi florifero, 10—16 cm. longo, glanduloso-pubescent; bracteae ovatae, cum bractcolis linearibus, diu persistentes, ad 0.2 cm. longae; pedicelli vix 0.1 cm. longi; calycis segmenta fere libera erecta, demum divergentia, lineari-lanceolata acuminata, dorso carinata, glanduloso-setosa, 0.7—0.8 cm. longa; corolla "pink" (carnea? rosea?), tubo 2 cm. longo, 0.5 cm. diam., segmentis obovatis apiculatis, 0.5 cm. longis, 0.4—0.5 cm. latis; filamenta basi vera dilatata, tubo aequilonga, antheris 0.2 cm. longis; ovarium glabrum, stylo (in flore unico dissecto) 1.5 cm. longo; capsula demum e basi in 5 valvas lineares acutas subrigidas, 0.8 cm. longas derupta, valvis interdum, ut videtur, cum corolla deciduis, semine lineari acuto, 0.5 cm. longo, persistente.

South-West Africa: Naukluft Mountains, river-bed between Goas and Kabiras, Jan., 1916, *H. H. W. Pearson* (Percy Sladen Memorial Expedition, No. 9080); Bull's Mouth Pass, Dec. 1915, *id. (id. No. 8952)*.

A very distinct species, with the habit of *P. tristis*, Ait., but differing in the shape of the leaves, the less tubular calyx with much shorter glandular hairs, and in other characters. (Pl. 1, c.)

Solanum rigescentoides, Hutchinson; affinis *S. rigescenti*, Jacq., sed ramulis et foliis glabris (nec dense stellato-pubescentibus) differt.

Suffrutex 0.85 m. altus; ramuli dense aculeati, flexuosi, virides, glabri, aculeis a ramulis angulo 90° abeuntibus, gracilibus, stramineis, usque ad 1.2 cm. longis. Folia longe petiolata, ambitu elliptica vel ovato-elliptica, profunde repando-lobulata, apice triangularia, subacuta, basi truncata vel brevissime cuneata, 2.5—5 cm. longa, 1.5—4 cm. lata, tenuiter chartacea, crasse repando-lobulata, lobulis obtuse triangularibus, utrinque glabra, costis interdum parce setosis exceptis; nervi laterales utrinsecus 3—4, a costa sub angulo 45°—60° abeuntes, prominuli; petioli graciles, 1.5—2 cm. longi, glabri vel parce aculeati. Pedunculi 2—3-flori, graciles, aculeati, foliis multo breviores. Calyx 5 mm. longus obconico-campanulatus, lobis lanceolatis acutis extra parce (plerumque 1—2) aculeatis. Corollae tubus 4 mm. longus, lobis 7 mm. longis, triangulari-lanceolatis, subacutis, extra breviter pubescentibus. Antherae exsertae, 6 mm. longae. Stylus corollae paullo longior. Bacca depresso-globosa, nitens, circiter 1 cm. diametro, pedicellis abrupte recurvatis. *S. rigescens*, C. H. Wr. in Dyer, Fl. Trop. Afr. iv, 2, 227, non Jacq.

South-West Africa: Windhuk, bush 2½ ft., flowers mauve; 15 Jan. 1916, *H. H. W. Pearson* (Percy Sladen Mem. Exped., 1915-16, No. 9772); Onanis, *Belck* 6.

Clerodendron Teaguei, Hutchinson (*Verbenaceae-Viticeae*); affinis *C. myricoides*, var. *discolore*, Baker, sed foliis basi conspicue auriculatis differt.

Caules (vel rami?) foliati, molliter laxe tomentosi, internodiis plerumque circiter 3 cm. longis. Folia sessilia, late ovata, sensim vel subabrupte acute acuminata, ad basin conspicue et late auriculatam attenuata, usque ad 15 cm. longa et 12 cm. lata, rigide chartacea, crasse et simpliciter serrata, supra scabra, infra molliter tomentella; nervi laterales utrinsecus circiter 6, supra leviter immersi, infra elevati, marginem versus conjuncti et ramosissimi; venae laxae, infra prominulae. Panicula terminalis, laxe foliata, subpyramidalis, circiter 10 cm. longa; cymulae circiter 3-florae, foliis subtendentibus paullo longiores, molliter pubescentes; pedunculi ad 1.5 cm. longi, graciles; bractae lineari-subulatae, 4 mm. longae; pedicelli laterales 1 cm. longi, terminales vix 3 mm. longi. Calyx late cupularis, extra appresse pubescens, 4 mm. longus, lobis triangularibus acutis marginibus subglabris. Corolla circiter 1 cm. longa, glabra. Stamina longe exserta, antheris 1.25 mm. longis. Stylus gracilis, bilobatus. Fructus trilobatus, niger, vix 1 cm. diametro, glaber.

Tropical Africa. Southern Rhodesia: Odzani River Valley, Manica Distr., 1915, *A. J. Teague*, No. 552.

This is a very handsome and striking species, differing from all the known forms of *Clerodendron myricoides* in its strikingly auriculate leaves.

Homeria lilacina, L. Bolus (*Irideae-Moraceae*), foliis productis 3, anguste linearibus, perianthio lilacino.

Herba glabra gracilis, ad 23 cm. alta; cormus globosus, tunica extima rigida, segmentis linearibus acuminatis, 1.5 cm. diam.; folia subrigida, setaceo-acuminata, unico radicali, duobus caulinis, 0.2—0.3 cm. lata, infima 30 cm. longa, suprema 15 cm. longa; cyma laxa; spathae valvae exteriores submembranaceae, flavae, setaceo-acuminatae, 2.5—4 cm. longae; perianthium 3—3.5 cm. diam., segmentis apice rotundatis, purpureo-vittatis, laminae basi luteo-notatis, macula purpureo-cincta, 2 cm. longis, exterioribus cuneatis, interioribus oblanceolatis; antherae lineares, dimidio styli aequilongae; ovarium cylindricum; stylus filiformis, 1 cm. longus, ramis linearibus, apicem versus dilatatis, breviter bilobatis, lobis obtusissimis, dense ciliatis.

Cape Province: Karroo Region; nr. Matjesfontein, *G. Beattie*, *F. Bolus* (Bolus Herbarium, No. 15186).

Described from living specimens which flowered at Kirstenbosch

in Sept. 1915—1918. The three narrow produced leaves together with the lilac perianth serve to distinguish this species. (Pl. II, A.)

Homeria bifida, L. Bolus, folio producto unico, perianthio luteo, styli ramis late oblongis bifidis.

Herba glabra, 40 cm. alta; cormus subglobosus, tunica extima sat tenui, fere integra, crebre tenuiterque nervata, 1.3 cm. diam.; folium longe vaginans, lineare subrigidum, sat conspicue nervatum, circa 50 cm. longum, ad 0.7 cm. latum; cyma densa; spathae valvae longe setaceo-acuminatae, 3—7 cm. longae, exteriores submembranaceae, interiores herbaceae; perianthium 2.2 cm. diam. segmentis breviter unguiculatis, laminae basi aurantiaco-notatis et minute viridi-maculatis, 1.5 cm. longis exterioribus oblongis, abrupte in unguem angustatis, obtusis apiculatis, 0.5 cm. latis, interioribus oblanceolatis acutis, ad 0.4 cm. latis; staminum tubus minute pubescens, antheris oblongis, 0.2 cm. longis; ovarium cylindricum, 0.6 cm. longum, stylo 0.6 cm. longo, apicem versus valde dilatato, ramis lato oblongis, 0.2 cm. longis, bifido, segmentis divergentibus, apice truncatis; capsula cylindrica, 1.2 cm. longa.

Described from three living specimens found growing on the "Aloe Kopje" in the National Botanic Gardens, Kirstenbosch, without note of origin, Sept. 1918 (Bolus Herbarium, No. 15185).

The distinguishing mark of this species is the broadly oblong bifid style-branches. (Pl. II, B.)

Homeria speciosa, L. Bolus, foliis productis 4, perianthio pallide lilacino, ovario muriculato, et capsula brevirostrata bene distinguitur.

Herba glabra robusta, ad 55 cm. alta, caule ad 0.8 cm. diam.; folia linearia, setaceo-acuminata, sat conspicue nervata, 22 cm. longa vel ultra, ad 2.3 cm. lata; cyma densissima, ad 30 cm. longa, 10 cm. diam., pedicellis 3—5 cm. longis; spathae valvae membranaceae, crebre tenuiterque nervatae, setaceo-acuminatae, 0.4—0.8 cm. longae; perianthium ad 6 cm. diam., segmentis obtusis, 3.5—4 cm. longis, exterioribus suboblongis, breviter lateque unguiculatis, ad 1.3 cm. latis, interioribus oblanceolatis basin versus gradatim angustatis, ad 1 cm. latis; antherae lineares, 1 cm. longae; ovarium cylindricum, stylo 1 cm. longo, ramis demum antheras parum excedentibus; capsula cylindrica, inconspicue muriculata, 1.4 cm. longa.

Cape Province: Karroo Region; near Prince Albert, alt. 2000 ft., fl. Sept., 1911, *A. M. Krige* (Bolus Herbarium, No. 13486).

Easily distinguished by the four produced leaves, pale lilac perianth, muriculate ovary, and shortly beaked capsule.

Described from dried specimens, in which the style-branches could not be seen satisfactorily. The leaves, with one exception, had

been eaten or broken off so that it is impossible to state the length attained by them. The flowers are among the most beautiful of the *Moraceae* known to me, but whether they are normally as large and fine as they were in the spring of 1911, which was remarkable for the luxuriant growth of the flora round Prince Albert, I have not been able to ascertain.

Watsonia Galpinii, L. Bolus (*Irideae-Ixieae*), ab omnibus ceteris sectionis "Eu-Watsonia" habitu graciliore, valvae spathis minoribus, perianthii tubo brevioris, et segmentis pro ratione longioribus distinguitur.

Cormus depresso-globosus, basi obliquus, 2 cm. diam., radices "ancorales" plurimas emittens, his tum apicem versus in radículas fibrosas ramosas, tunicis crebre nervosis atro-brunneis; caulis erectus, e basi ramosus, ad 75 cm. altus; folia radicalia 4—8, adscendentia vel fere erecta, linearia, acute acuminata, cum omnibus partibus, glaberrima, crebre tenuiterque nervosa, nervo medio marginibusque tantum subprominentibus, ad 35 cm. longa, 1—1.5 cm. lata; pedunculus 5 cm. longus; spica simplex vel ramosa, floribus laete rubris, valvae spathae omnino herbaceae vel apice vero submembranaceae, laete virides, apicem versus purpurascens, exteriore lanceolata, setaceo-acuminata, infima 3.2 cm., suprema 0.6 cm. longa, intermediis 1.5—2 cm. longis, interiore ovata vel late ovata acuminata, 0.8—1.4 cm. longa; perianthii tubus 2 cm. longus, dimidio inferiore fere stricto, filiformi, vix 0.15 cm. diam., dimidio superiore infundibuliformi, apice 0.7 cm. diam., segmentis patentibus, 1.5 cm. longis, exterioribus suboblongis subcutis, minute apiculatis, ad 0.8 cm. latis, interioribus oblongo-obovatis, 1 cm. latis; stamina fere ad apicem segmentorum attingentia, antheris 0.9 cm. longis, albidis, fissuris purpureis, polline albedo; ovarium subobconicum, circa 0.5 cm. longum, stylo, cum ramis primariis 0.9 cm. longis, 2.9 cm. longo, stigmatibus ipsis circa 0.2 cm. longis; capsula obconica, 1 cm. longa.

Cape Province: South-Western Region; river-edge, Lottering Bush, Zitzikama, circa 500 ft., fl. Sept., *E. E. Galpin*, 4698; Knysna, *A. V. Duthie*. Flowered in March, 1919, at the National Botanic Gardens, Kirstenbosch (No. $\frac{239}{18}$).

Distinguished from the rest of the section "Eu-Watsonia" by the more slender habit, the smaller spathe-valves, the shorter perianth-tube and relatively longer segments.

Antholyza Watsonius, L. Bolus, nov. comb. = *Gladiolus Watsonius*, Thunb. *Antholyza Watsoniana*, Pax in Engl. and Prantl, *Natürl. Pflanzenf.* II, 5, 156 (1888), sphalm.

Antholyza Gawleri, L. Bolus, nov. comb. = *Antholyza revoluta*, Burm. (var. β , *Gawleri*, Baker; *Gladiolus Gawleri*, Klatt).

Antholyza Muirii, L. Bolus (*Irideae-Ixia*) *A. Watsonius* affinis sed cormi tunicis rigidioribus crassioribusque, folio producto ad 25 cm. longo, perianthii segmentis inferioribus lateralibus brevibus differt.

Erecta, omnino glabra, ad 55 cm. alta; cormus globosus, apicem versus in collum attenuatus, brunneus, 2—2.4 cm. longus, 1—1.7 cm. diam., tunicis in segmenta permulta imbricata lineari-lanceolata acuta fassis; folia saepissime 5, inferiora 2 ad vaginas reducta, tertium productum, vagina ad 16 cm. longa, lamina angustissime lineari, medio nervo marginibusque incrassatis, sulcis vix visis, ad 25 cm. longa, 0.15 cm. lata, superiora reducta, lamina 2.5—5 cm. longis; spica laxa secunda, 7—12 cm. longa, 2—4-fl., floribus patentibus vel rarius erecto-patentibus, rubentibus; spathae valvae lineares obtusae, tenue multi-nervosae, in siccis olivaceae, exteriores 3—5.4 cm. longae, interiores 2—3.4 cm. longae; perianthii tubus curvatus vel fere strictus, ad 3.2 cm. longus, basi 0.15, apice ad 0.6 cm. diam., segmentis acuminatis, saepissime apiculatis, summo inter lateralia porrecto, more *A. Cunonia*, obovato-spathulato, 1.9—2.2 cm. longo, lateralibus superioribus ellipticis, 1.7—1.9 cm. longis, lateralibus inferioribus obovatis, 1—1.3 cm. longis, infimo anguste elliptico, 1.4—1.5 cm. longo; stamina dimidium segmenti summi excedentia, antheris 0.8—1 cm. longis; stylus demum segmento summo fere aequilongus.

Cape Province: South-Western Region; Riversdale Div., hills behind Albertinia, fl. May, *John Muir*, 1348. Exhibited at the Caledon Wild Flower Show, Sept. 1915 (Bolus Herbarium, No. 14953).

Allied to *Antholyza Watsonius*, L. Bolus, but differs in having the tunics of the corm split up into rigid thick segments, the produced leaf much longer, the uppermost perianth-segment porrect between the lateral segments, and the lower lateral segments much shorter than the rest.

Antholyza Guthriei, L. Bolus, *A. quadrangulari* proxime accedit, sed foliis productis 4, brevioribus, marginibus haud conspiciue incrassatis, distinguitur.

Erecta, omnino glabra, ad 55 cm. alta; cormus subglobosus, 1.3 cm. diam., tunicis demum in segmenta capillacea fassis; folia basalia 5, infimum ad vaginam reductum, producta 4, lamina linearibus acuminatis 3-nervatis, nervis marginibusque fere aequaliter prominentibus, ad 19 cm. longa vel ultra, ad 0.3 cm. lata, caulina 2, ad 5 cm. longa; spica laxa secunda, ad 20 cm. longa, 1—7-fl., floribus patentibus; spathae valvae lineares vel oblongae, acuminatae vel subobtusae, exteriores, in siccis, olivaceae vel rubentes, 2.5—4.5 cm., interiores 1.7—3.5 cm. longae; perianthii tubus leviter curvatus, parte inferiore ad 1.8 cm., superiore ad 2 cm. longa, segmentis inaequalibus obtusis,

summo obovato, 1.5—2 cm. longo, 1—1.4 cm. lato, lateralibus superioribus obovatis vel ellipticis, cum summo rubentibus, maculis lineisque saturioribus notatis, 1.4—1.8 cm. longis, 0.7—1 cm. latis, lateralibus inferioribus oblongo-obovatis 0.7—0.8 cm. longis, 0.4—0.5 cm. latis, cum infimo oblongo-elliptico, 1.1—1.2 cm. longo, aurantiacis; stamina saepius segmenti summi dimidium excedentia, antheris versatilibus, 0.4—0.5 cm. longis; stylus demum segmentum summum aequans.

Capè Province: South-Western Region; Elim, alt. 250 ft., fl. July, *F. Guthrie*, 3827. Exhibited at the Caledon Wild Flower Show, Sept. 1915 (Bolus Herbarium, No. 14954).

Very closely allied to *A. quadrangularis*, Burm., but is distinguished by having four produced leaves which are shorter and are not conspicuously thickened on the margins.

A. Sladeniana, Pole Evans (*Liliaceae-Aloineae-Serrulatae*); *A. variegata*, L., affinis, sed inflorescentiis ramosis, floribus minoribus, tenuioribusque differt.

Herba succulenta, acaulis. *Folia* imbricato-trifaria, lanceolata-acuta, supra concava, carinata, 7—9 cm. longa et 3—4 cm. lata, utrinque viridia maculisque albis oblongis confluentibus sub-fasciatim transverse variegata, marginibus carinaque cartilagineis, superne minute denticulatis. *Pedunculus* erectus, supra medium in ramos 3 erecto-arcuatos subaequilongos divisus; racemi 12—20 cm. longi, sub-laxi; bracteae minutae, scariosae, deltoideo-acutae; pedicelli ca. 15 mm. longi, erecto-patuli. *Perianthium* miniatum, 20—23 mm. longum, distincte decurvatum, supra ovarium paullum constrictum et deinde inflatum, segmenta ca. 4 mm. longa, tri-nervia; filamenta haud exserta.

South-West Africa: Nauchas, on granite, Jan. 1916, *H. H. W. Pearson* (Percy Sladen Memorial Expedition, 1915–16, Keetmanshoop—Ababies—Windhuk. No. 9000). “Leaves irregularly but distinctly tristichous; flowers dull pink.”

Allied to *A. variegata*, L., but easily distinguished by its tall branched inflorescence and smaller and more delicate flowers.

Apicra rubriflora, L. Bolus (*Liliaceae-Aloineae*), perianthio rubro, et segmentis exterioribus reduplicato-valvatis bene distinguitur.

Herba erecta glabra rigida, ad 47 cm. alta, caule 7 cm. longo vel ultra, dense folioso; folia patentia, in 4 series disposita, ovato-triquetra pungenti-acuminata, supra concava, 2.5—4 cm. longa; pedunculus 3—4 foliis bracteiformibus distantibus onustus, ad 29 cm. longus; racemus subsecundus, sat densus, ad 12 cm. longus, floribus adscendentibus; bracteae lanceolatae acuminatae, saepius 0.6 cm. longae, pedicellis aequilongis vel parum longioribus; perianthium laete rubrum,

2—2.5 cm. longum, 0.5—0.6 cm. diam., tubo cylindrico, apice leviter constricto decurvatoque, segmentis conniventibus; stamina exteriora segmentis subaequilonga, interiora tubum vix excedentia; ovarium cylindricum 0.5 cm. longum, stylo (in flore unico dissecto) 1 cm. longo.

Cape Province: South-Western Region; Swellendam Div., Bonnie Vale, *Smith* (National Botanic Gardens, No. $\frac{2}{17}$).

A very distinct species characterised by the red perianth and the reduplicate-valvate outer perianth-segments. Described from living specimens which flowered at Kirstenbosch, April, 1918. (Pl. II, D.)

Agapanthus Walshii, L. Bolus (*Liliaceae-Allieae*), ab *A. umbellato* distinguitur perianthii tubo 2—3-plo longiore segmentis.

Herba glabra, 60—70 cm. alta; folia saepe cum floribus non bene evoluta, linearia acuta subcoriacea, ad 19 cm. longa, 1 cm. lata; spatha non visa; umbellae ad 19-fl., floribus pendulis; perianthium 3—5.4 cm. longum, segmentis 1.4—1.5 cm. longis; capsula ignota.

Cape Province: South-Western Region; Caledon Div., nr. Steenbras Railway Station, alt. ca. 1800 ft., fl. Dec.—Jan., *A. Walsh* (Bolus Herbarium, No. 15675).

Described from several living specimens. Distinguished from *A. umbellatus*, L'Hérit., by the perianth-tube being 2—3 times longer than the segments. (Pl. II, c.)

FLOWERING PLANTS COLLECTED IN SOUTH-
WEST AFRICA BY THE PERCY SLADEN
MEMORIAL EXPEDITION, 1915-1916¹

By R. WORDSWORTH, J. HUTCHINSON, F. BOLUS,
AND L. BOLUS.

MENISPERMACEAE.

Antizoma angustifolia, Meisn. Between Nauchas and Areb, on plains of
granitic sand, 9014.

CRUCIFERAE.

Sisymbrium garipepinum, Burch. Between Hoffnungsfelde and Haris, in
river-beds and low sandy places on plateau, 9538.

Heliophila crithmifolia, Willd. North of Nauchas, in granitic sand, 9007.

Senebiera integrifolia, DC. 8 km. north-west of Nomtsas, in mud in Usib
River, 9315. At Tsubgaus, on sand-dunes of Leber River, 9202.
Below Ababes, in bed of Tsondeb River, 9158.

Lepidium linoides, Thunb. Holoog, in drying sand in bed of Great Fish
River, 9802.

Lepidium ruderales, Linn. River-bed between Hoffnungsfelde and Haris, 9547.

CAPPARIDACEAE.

Cleome rubella, Burch. Kuisib River bed, at Haris, 9514.

Cleome diandra, Burch. Little Karas Mountains, western foothills shale-
slopes, at Holoog, 9732.

Polanisia Paxii, Gilg and Benedict. Great Fish River bed, 9278.

Polanisia lutea, Sond. South of Choaberib, among stones, 9453. Little Karas
Mountains, western foothills, 9720. Great Fish River, in sand, 9261.

Gynandropsis pentaphylla, DC. Awas Mountains, at Aub, 9520. Holoog,
9816.

Maerua arenicola, Gilg. Ababes, common on plains and mountains, 9172.
Between Gellap and Great Fish River, on dry shale-slopes and in sand
of river-bed, 9288.

Boscia foetida, Schinz. Keetmanshoep, 9280.

¹ Percy Sladen Memorial Expedition in South-West Africa, Report No. 72. Acknowledgement
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publication of this Report—viz. the sum of £25. 10s. 5d., being the balance of the Government
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POLYGALACEAE.

Polygala leptophylla, Burch. Ababes, on broken granite, 9179. Awas Mountains, 12 km. east of Windhuk, on quartzite, 9608. Between Haris and the Awas Mountains, on high plateau, 9685. Naukluft Mountains, at Kabiras, on granite, 9058. Little Karas Mountains, western foothills, on shale slopes near Holoog, 9751.

Polygala abyssinica, Fresen. Ababes, in bed of Tsondeb River, 9161.

Polygala virgata, Thunb. var. *genistoides*, Harv. Nauchas, in Kam River bed, 9048. Naukluft Mountains, in river-bed below Goas, 9067.

CARYOPHYLLACEAE.

Dianthus micropetalus, E. Mey. Sandy plains north of Areb, 9476.

PORTULACAEAE.

Portulaca sp. near *P. quadrifida* (material insufficient). Awas Mountains, on quartzite slopes 12 km. east of Windhuk, 9792.

Anacampseros quinaria, E. Mey. var. *Schmidtii*, Berger. At Kubib, on sandy plain, 9471. Hoffnungsfelde, on stony plateau, 9568.

Talinum cafrum, E. and Z. Between Haris and the Awas Mountains, on high plateau, 9677. Between Gamis and Bull's Mouth Pass, 8928. Nauchas, in granitic sand, 9498.

MALVACEAE.

Sida longipes, E. Mey. Awas Mountains, on quartzite hills 12 km. east of Windhuk, 9783, 9784. Between Choaberib and Gurumanas, 9403.

Abutilon pycnodon, Hochr. Nauchas, 9006.

Abutilon indicum, Don. Awas Mountains, on quartzite hills, 12 km. east of Windhuk, 9607.

Pavonia macrophylla, E. Mey. Between Gamis and Bull's Mouth Pass, on banks of upper streams of Fish River, 8933. Klein Windhuk, 9617. 8 km. north-west of Nomsas, on shale-banks of Usib River, 9326.

Hibiscus calycinus, Willd. Klein Windhuk, 9618.

Hibiscus pusillus, Thunb. Between Haris and the Awas Mountains, on high plateau, 9696. Awas Mountains, on quartzite slopes 12 km. east of Windhuk, 9796.

Hibiscus Elliottiae, Harv. Little Karas Mountains, western foothills, on sandy stream-banks and shale-slopes near Holoog, 9741. Ganaams, on shale-banks of Leber River, 9372. Ababes, stream-bed, 8908.

Hibiscus micranthus, Linn. Between Voigtsgrund and Brekdorn, among stones in minor stream-bed, 9350.

Hibiscus intermedius, A. Rich. Windhuk, on shale-slopes, 9641.

Hibiscus pseudosida, Ulbrich. Awas Mountains, 12 kilometres east of Windhuk on quartzite hills, 9781. Windhuk, on shale slopes, 9621.

Fugosia (*Cienfugosia pentaphylla*, Schum). Above Ababes, bed of Tsondab River, 9129, 9175.

STERCULIACEAE.

Hermannia comosa, Burch. var. *minor*. Nauchas, 9049, 9052. Naukluft Mountains, at Kabiras, 9064.

Hermannia abrotanoides, Schrad. Between Haris and the Awas Mountains, on a high plateau, 9688. Choaberib, 9595. At Kubib, in vlei-ground, 9487.

Hermannia filipes, Harv. Windhuk, shale-slopes, 9637.

Hermannia affinis, K. Schum. Below Ababes, bed of Tsondab River, 9151. Gamis, 8963.

Hermannia spinosa, E. Mey. Namseb, hard dry plain, 9337.

Hermannia fruticulosa, K. Schum. Little Karas Mountains, western foothills, near Holoog, 9765.

Hermannia brachypetala, Harv. Between Hoffnungsfelde and Haris, sandy places on plateau, 9546.

Hermannia Helianthemum, K. Schum. Hoffnungsfelde, 9590, 9591. Between Voigtsgrund and Brekdorn, among stones, 9355. North of Gurumanas, river-bed, 9573, 9571. Naukluft Mountains, at Kabiras, among granite, 9063. Nauchas, on granite, 9041. Kubib, 9488. Witkobus, on sandy banks, 8987. Plains south of Choaberib, 9446.

Hermannia bipinnata, Glover. Witkobus, river-flat, 8986.

Hermannia coccocarpa, Burt-Davy. Between Achterfontein and Gelwater, 9234.

Hermannia abyssinica, K. Schum. ex Schinz. Between Hoffnungsfelde and Haris, in river-bed, 9549.

Hermannia grandiflora, Ait. Naukluft Mountains, near Kabiras, on river-bank, 9093.

TILIACEAE.

Grewia occidentalis, Linn. Little Karas Mountains, western foothills near Holoog, 9762. Below Holoog Station in bed of Great Fish River, 9809.

Grewia pilosa, Lam. Windhuk, 9776.

Grewia cana, Sond. Between Nauchas and Areb, on granite, 9032. Little Karas Mountains, western foothills, on shale-slopes and in river-bed near Holoog, 9735. Klein Windhuk, 9787. Ganaams, shale-banks of Leber River, 9369. Great Fish River bed, 9267.

Grewia sp. (Specimen incomplete.) Ababes, on breccia banks of Tsondab River, 9145.

Corchorus asplenifolius, Burch. Near Noas, sandy ground, 9402. On the road to Tsubgaus, north of Freistadt, on high plateau, 9396.

ZYGOPHYLLACEAE.

- Tribulus pterophorus*, Presl. South of Choaberib, on stony plains, 9461.
Between Gibeon and Reistadt, on dry shale-rocks, 9212.
- Sisyndite sparteae*, E. Mey. Between Gellap and Great Fish River, on dry shale-slopes, 9292.
- Zygophyllum simplex*, Linn. At outspan north of Aintsas, in sand, 9238.
- Zygophyllum suffruticosum*, Schinz. Great Fish River, on dry shale-banks, 9260. Keetmanshoep, 9283. South of Choaberib, in stony places, 9452. Little Karas Mountains, western foothills, shale-slopes near Holoog, 9748. Between Goas and Kabiras, on river-bank, 9088.
- Zygophyllum tenue*, Glover. Locality uncertain, 9817.
- Fagonia minutistipula*, Engl. (e descr.). Bull's Mouth Pass, 8951. Above Ababes, in dry ravine of Tsondab River, 9193.
- Neoluderitzia sericeocarpa*, Schinz. Great Fish River, 9299.

GERANIACEAE.

- Sarcocaulon Marlothii*, Engl. Near Ababes, on dry rocky slopes, 8906. Naukluft Mountains, 9104.
- Oxalis lateriflora*, Jacq. At Haris, in Kuisib River bed, 9561. Between Haris and the Awas Mountains, on high plateau and in river-bed, 9600. Awas Mountains, 8 km. east of Windhuk, in rock-crevices, 9613.

RUTACEAE.

- Thamnosma africana*, Engl. Above Ababes, in bed of Tsondab River, 9125.

BURSERACEAE.

- Commiphora abyssinica*, Engl. var. *simplicifolia*. Naukluft Mountains, on rocks, 9109. Little Karas Mountains, western foothills, near Holoog, in sandy bed of stream, 9747. On hill behind Gamis Farm House, 8978.
- Commiphora namaensis*, Schinz (e descr.). Little Karas Mountains, western foothills, 9718.
- Commiphora hereroensis*, Schinz (e descr.). Bull's Mouth Pass, on middle and upper slopes, 8917. Ababes, on hill-slopes, 8909.
- Commiphora* sp. (material incomplete). Above Ababes, on banks of the Tsondab River, 9134, 9178.

CELASTRACEAE.

- Gymnosporia* sp. Naukluft Mountains, between Goas and Kabiras, 9072.

RHAMNACEAE.

- Zizyphus mucronata*, Willd. Awas Mountains, pass between Haris and Aub, 9662. At Holoog, on banks of Great Fish River, 9812. At Ababes, common on banks of Tsondab River, 9135.

SAPINDACEAE.

Pappea capensis, E. and Z. Little Karas Mountains, western foothills, near Holoog, 9746.

Aitonia capensis, Linn. f. Voigtsgrund, limestone flat, 9365. 8 km. north-west of Nomtsas, on banks of Usib River, 9321. Below Ababes, on banks of Tsondeb River, 9136.

AMPELIDACEAE.

Cissus lanigera, Harv. Windhuk, 9644. Between Goas and Kabiras, 9084. Plains north of Kubib, 9430.

Cissus Seitziana, Gilg and Brandt. Naukluft Mountain between Ababes and Homnus, 9097, Areb, 9497.

Cissus hereroensis, Schinz. Between Ukos and Choaberib, 9440. Ukos, 9438. Between Nauchas and Areb, 9013. Awas Mountains, on quartzite hills 12 km. east of Windhuk, 9780.

ANACARDIACEAE.

Rhus lancea, Linn. f. Between Aub and Windhuk, 9652. Between Nauchas and Areb, on river bank, 9031. Gurumanas, in stream-bed, 9423.

Rhus Marlothii, Engl. Valley, a little east of Ababes, 8910. Bull's Mouth Pass, 8912.

Rhus sp. Above Ababes, on bed of Tsondeb River, 9181.

Rhus sp. Between Ukos and Choaberib, 9428. Between Kubib and Ukos, 9436. Between Haris and the Awas Mountains, on plateau in sandy ground, 9507. Between Nauchas and Areb, on plains of granitic sand, 9010.

Heeria crassinervia, Engl. Naukluft Mountains, near Homnus on rocks, 9108.

Heeria sp. (material incomplete). Between Gellap and Great Fish River, 9284.

MORINGACEAE.

Moringa ovalifolia, Dtr. & Brge. Naukluft Mountains, near Homnus on granite slopes, 9107. West of Ababes, above Voigt's Farm, 8911.

LEGUMINOSAE.

Lebeckia linearifolia, E. Mey. Between Achterfontein and Gelwater, on sand-dunes, 9233.

Lebeckia elongata, Hutch. locality? 9899.

Crotolaria distans, Benth. Awas Mountains, in pass between Haris and Aub, 9674.

Crotolaria argyraea, Welw. 8 km. north-west of Nomtsas, on sand-banks of Usib River, 9317. North of Choaberib, in river-bed and on plateau, 9596. Windhuk, on slopes, 9774.

Psoralea biflora, Burch. Kubib Vlei, 9486.

Psoralea obtusifolia, DC. At Tsubgaus, sand-dunes of river, 9204. Above

- Ababes, sandy banks of Tson-dab River, 9189. Great Fish River, 9274, 9280, 9210. At Holoog, on banks of Great Fish River, 9808.
- Indigofera cryptantha*, Benth. Naukluft Mountains, Homnus, in river-bed, 9115.
- Indigofera argyroides*, E. Mey. Little Karas Mountains, western foothills, near Holoog, on shale-slopes, 9754.
- Indigofera transvaalensis*, Bak. f. South of Choaberib, prostrate among stones in stream-bed, 9441.
- Indigofera alternans*, DC. Choaberib, sandy ground, 9597. Haris, 9515.
- Indigofera heterotricha*, DC. Little Karas Mountains, western foothills, near Holoog on sandy banks of river, 9743. Above Ababes, in bed of Tson-dab River, 9121, 9150. Gurumanas, in sand, 9575. 8 km. north-west of Nomtsas, among stones in Usib River bed, 9306.
- Sylitra biflora*, E. Mey. Ababes, in granitic gravel, 9166. Between Gamis and Bull's Mouth Pass, in stream-bed and on banks of Upper Fish River, 8935. Little Karas Mountains, western foothills east of Holoog, on shale-slopes, 9758. Between Voigtsgrund and Brekdorn, 9348.
- Tephrosia damarensis*, Engl. Little Karas Mountains, western foothills east of Holoog, 9757. Windhuk, on slopes, 9775. Between Gelwater and Great Fish River, on dry shales, 9222. Great Fish River, on dry shale-banks, 9263. Naukluft Mountains, between Goas and Koichas, 9078.
- Tephrosia semiglabra*, Sond. Hoffnungsfelde, in sand, 9582. Between Hoffnungsfelde and Haris, trailing on sand, 9528.
- Sutherlandia frutescens*, R. Br. 8 km. north-east of Nomtsas, on sandy banks of Usib River, 9313.
- Lessertia benguellensis*, Baker. Naukluft Mountains, between Goas and Koichas, in river-bed, 9077. At Homnus, in river-bed, 9114. 10 km. north-west of Nomtsas, in sand-bed of tributary of Usib River, 8983.
- Lessertia macrostachya*, DC. var. β *atomaria*. Great Fish River, 9298.
- Vigna Burchellii*, Harv. 8 kilometres north-west of Nomtsas, on banks of Usib River, 9320. Hoffnungsfelde Plateau, 9589. Awas Mountains, 12 km. east of Windhuk, on quartzite hills, 9788. South of Choaberib, common on stony plains, 9451. Between Aub and Windhuk, 9647.
- Vigna triloba*, Walp. Haris, Kuisib River bed, 9554. Between Haris and the Awas Mountains, on high plateau, 9683. Awas Mountains, 12 km. east of Windhuk, on quartzite slopes, 9605. Between Hoffnungsfelde and Haris, in sand of river-bed, 9524.
- Dolichos Pearsonii*, Hutch. Between Nauchas and Areb, on granite banks of stream, 9019.
- Rhynchosia Totta*, DC. var. *grandiflora*, L. Bolus. Windhuk, on shale-slopes, 9638. Little Karas Mountains, western foothills near Holoog, in stream-beds, 9744.
- Rhynchosia* sp. nearest *R. minima*, DC. Locality uncertain, 9818.

- Caesalpinia Pearsonii*, L. Bolus. Ababes, breccia-banks of Tsondeb River, below farm, 9162.
- Hoffmanseggia lactea*, Schinz. Between Gamis and Bull's Mouth Pass, on sandy banks of stream of Upper Fish River, 8941. Little Karas Mountains, western foothills near Holoog, on shale-slopes, 9742. Naukluft Mountains, between Goas and Kabiras, 9062.
- Haematoxylon Dinteri*, Harms. Little Karas Mountains, western foothills east of Holoog Station, in sandy river-bed and in rock-crevices, 9717.
- Parkinsonia africana*, Sond. Between Gellap and Great Fish River, on dry shaly slopes, 9293.
- Cassia obovata*, Collad. North of Gelwater, on shale-plains, 9225. Naukluft Mountains, Kabiras, 9092.
- Cassia mimosoides*, Linn. Awas Mountains, 12 km. east of Windhuk, on quartzite hill, 9786.
- Bauhinia gariepensis*, E. Mey. North of Gelwater, on shale-plains, 9224. Between Gellap and Great Fish River, on shale-slopes, 9296. Between Gelwater and Great Fish River, 9221. Little Karas Mountains, western foothills near Holoog, 9736. Bull's Mouth Pass, 8914. Naukluft Mountains, north-east of Ababes, common on sandy plains, 9103.
- Elephantorrhiza* sp. (in fruit only). Bull's Mouth Pass, on steep slopes, 8919. Awas Mountains, pass between Haris and Aub, 9658.
- Xerocladia viridiramis*, Taub. Namseb, on clay and slightly saline flats, 9345.
- Acacia detinens*, Burch. Between Choaberib and Gurumanas, 9599. At Ababes, on banks and in bed of Tsondeb River, 9120.
- Acacia glandulifera*, Schinz. At foot of Bull's Mouth Pass, abundant on the flats, 8945. Holoog, common on plateau and on banks of Great Fish River, 9814. Namseb, 9335. Gurinaris, in river-bed, 9256.
- Acacia spirocarpodes*, Engl. Above Ababes, in bed of Tsondeb River, 9127.
- Acacia spinosa*, Marl. and Engl. Hills behind Gamis Farm House, 8977. Gibeon, on dry shale, 9207.
- Acacia Marlothii*, Engl. Windhuk, common on shale-slopes, 9629.
- Acacia dulcis*, Marloth. Windhuk, common on shale-slopes, 9624.
- Acacia hereroensis*, Engl. Between Hoffnungsfelde and Haris, on stony plateau, 9548.
- Acacia inermis*, Marloth and Engl. On hill behind Gamis Farm House, 8976. South of Great Fish River, on shaly slopes, 9297. Great Fish River, 9264.

ROSACEAE.

- Grielia Marlothii*, Engl. Between Achterfontein and Gelwater, 9227.

SAXIFRAGACEAE.

- Vahlia capensis*, Thunb. Between Tsubgaus and Ganaams, in minor stream-bed, 9387. At Tsubgaus, on sand-dunes of Leber River, 9205.

HAMAMELIDACEAE.

Myrothamnus flabellifolia, Welw. Naukluft Mts., in clefts in granite, 9101.

COMBRETACEAE.

Combretum apiculatum, Sond. Between Tsubgaus and Ganaams, on shale-cliffs on right bank of Leber River, 9391. Great Fish River Ravine, 9215. Awas Mountains, pass between Haris and Aub, 9656.

ONAGRARIACEAE.

Montinia acris, Linn. f. Windhuk, 9633. Awas Mountains, pass between Haris and Aub, 9660. Hill behind Gamis Farm House, 8978. 8 km. north-west of Nomtsas, in river-bed, 9304.

PASSIFLORACEAE.

Adenia Pascanthus, Harv. Between Haris and the Awas Mountains, on high plateau, 9690. Between Choaberib and Gurumanas, on sandy plains, 9407. Naukluft Mountains, at Kabiras, 9057.

CUCURBITACEAE.

Trochomeria debilis, Hook. f. Between Nauchas and Aub, 9001. Awas Mountains, between Aub and Windhuk on slopes, 9651, 9654. Between Hoffnungsfelde and Haris, 9540. Between Haris and the Awas Mountains on high plateau, 9500.

Cucumis africanus, Linn. f. Holoog, in bed of Great Fish River, 9704. Hoffnungsfelde, 9586.

Cucumis myriocarpus, Naud. At Haris, in Kuisib River bed, 9510.

Cucumis Melo, Linn. Holoog, in bed of Great Fish River, 9705. South of Choaberib, on stony plain, 9459. At Ganaams, on banks of Leber River, 9375, 9374.

Cucumis sp. Between Hoffnungsfelde and Haris, in sandy places.

Coccinea sessilifolia, Cogn. Between Ukos and Choaberib, 9437. Awas Mountains, at Aub, 9663, 9521. Haris, on stony plateau, 9509.

Corallocarpus Welwitschii, Hook. f. Voigtsgrund, 9363. 8 km. north-west of Nomtsas, in bed of Usib River, 9303.

Corallocarpus Schinzii, Cogn. Awas Mountains, quartzite cliff over river-bed, 9616.

Corallocarpus sp. (material insufficient). Naukluft Mountains near Ababes, 9098.

FICOIDEAE.

Mesembrianthemum floribundum, Ait. Naukluft Mountains, between Goas and Kabiras, on saline flats, 9090.

Mesembrianthemum simile, Sond. var. namaquense. Between Kabiras and Nauchas, in sandy places, 9034. Between Tsondeb and Great Fish

River, 9286. Above Ababes, in Tsondab River bed, 9184. At Tsubgaus, on sand-dunes of Leber River, 9398. Holoog, in bed of Great Fish River, 9703.

Mesembrianthemum noctiflorum, Linn. Between Achterfontein and Gelwater on sand-dunes, 9230.

Mesembrianthemum uncinellum, Haw. Between Haris and the Awas Mountains, on high plateau, 9681. Between Choaberib and Gurumanas, in stony places, 9405.

Tetragonia spicata, Linn. f. South of Choaberib, in stony places, 9457. Between Hoffnungsfelde and Haris, on plateau, 9525.

Aizoon Burchellii, N. E. Br. Between Haris and the Awas Mountains, on high plateau, 9687.

Galenia papulosa, Sond. Above Ababes, in bed of Tsondab River, 9126.

Galenia crystallina, Fenzl. Between Achterfontein and Gelwater, on sand-dunes, 9228.

Galenia africana, Linn. 8 km. north-west of Nomtsas, on sandy banks of Usib River, 9327.

Trianthema crystallina, Vahl. Between Gellap and Great Fish River, in sandy places, 9287. Between Achterfontein and Gelwater, on sand-dunes, 9231.

Anisostigma Schenckii, Schinz. Leber River, very abundant on dunes, 9258. Nomtsas, in Great Fish River sand-basin, 9333. North of Aintsas, 9246. Great Fish River at Holoog, 9806.

Mollugo Cerviana, Ser. var. γ pusilla. Great Fish River, 9800.

Pharnaceum verrucosum, E. and Z. At Witkobus, on river-flats, 8985. Between Hoffnungsfelde and Haris, in sand of river-bed, 9528.

Pharnaceum (*Hypertilis spergulacea*, E. Mey.). Little Karas Mountains, western foothills, on river-banks near Holoog, 9734.

Gisekia pharnaceoides, Linn. Holoog, in bed of Great Fish River, 9700.

Gisekia Miltus, Fenzl. Kuisib River bed at Haris, 9511.

Limeum aethiopicum, Burm. 8 km. north-west of Nomtsas, in sand in Usib River, 9305. Naukluft Mountains, between Goas and Kabiras in river-bed, 9069.

UMBELLIFERAE.

Heteromorpha arborescens, Ch. and Schl. Between Haris and the Awas Mountains, on high plateau, 9678.

Pituranthos aphylla, O. Kunze. Naukluft Mountains, at Homnus in river-bed, 9113. Namseb, limestone substratum, in sand, 9336. Gurumanas, on dry slopes, 9421. Between Haris and Aub, in stream-bed, 9017.

RUBIACEAE.

Oldenlandia stricta, K. Schum. At Kubib, on vlei-ground, 9480. Naukluft

Mountains, between Goas and Kabiras in river-bed, 9082. Nauchas, in Kam River bed, 9045.

Oldenlandia thymifolia, O. Kunze. Windhuk, on shale-slopes, 9642. Little Karas Mountains, western foothills at Holoog, 9760.

DIPSACEAE.

Scabiosa Columbaria, Linn. Between Hoffnungsfelde and Haris, in river-bed, 9550. At Haris, in Kuisib River bed, 9557.

COMPOSITAE.

Vernonia Kraussii, Sch. Bip. Between Haris and the Awas Mountains, on high plateau, 9675.

Pteronia unguiculata, Sp. Moore. Between Nauchas and Areb, on granitic plains, 9028.

Felicia muricata, Nees. Between Haris and the Awas Mountains, on high plateau, 9697. Windhuk, on shale-slopes, 9773.

Felicia hyssopifolia, Less. Between Hoffnungsfelde and Haris, in sandy and stony places on plateau and in river-beds, 9529. North of Gurumanas, on plateau, 9577. Witkobus, on sandy banks, 8961. Near Gamis, sandy banks of head waters of Great Fish River, 8966. Kubib, on vleiground, 9489.

Felicia gariepina, L. Bolus (*Nidorella gariepina*, DC.). Between Choaberib and Gurumanas, 9404. South of Choaberib, on plains, 9445.

Nidorella resedaefolia, DC. Between Haris and the Awas Mountains, on high plateau, 9695.

Nidorella resedaefolia, DC. var. *rapunculoides*. Gamis, 8970. Below Ababes, in bed of Tsondeb River, 9141, 9148.

Tarchonanthus camphoratus, Linn. Between Gurumanas and Haris, on stony plateau, 9545.

Blumea gariepina, DC. 8 km. north-west of Nomtsas, on sandy bank of Usib River, 9324. Below Ababes, in bed of Tsondeb River, 9153.

Epaltes gariepina, Steetz. Naukluft Mountains, between Goas and Kabiras, on river-banks, 9086.

Nicolasia heterophylla, Sp. Moore. Namseb, on hard clay, 9339.

Helichrysum leptolepis, DC. Great Fish River bed, 9279. Between Nauchas and Areb, on plains of granitic sand, 9024. Between Kabiras and Nauchas, on plains, 9038.

Helichrysum herniarioides, DC. Between Nauchas and Areb, on plains of granitic sand, 9025.

Helichrysum viscidissimum, Hutch. Naukluft Mountains, below Goas, in river-bed in ravine, 9066.

Helichrysum sp. Holoog, on drying sand on bed of Great Fish River, 9803.

- Iphiona polygalifolia*, Benth. and Hook. Awas Mountains, 12 km. east of Windhuk, on quartzite hill, 9785.
- Pegolettia oxyodonta*, DC. Little Karas Mountains, western foothills, near Holoog on shale slopes, 9731. Above Ababes, sandy banks of Tsondeb River, 9188.
- Pulicaria capensis*, DC. Ganaams, shale-slopes of Leber River, 9379, 9380.
- Geigeria passerinoides*, Harv. Between Kabiras and Nauchas, in sandy places, 9040.
- Geigeria passerinoides*, Harv. forma. Naukluft Mountains, between Bull's Mouth Pass and Ababes, on saline plain, 8902.
- Geigeria Schinzii*, O. Hoffm. Windhuk, shale-slopes, 9769.
- Geigeria pectidea*, Harv. North of Aintsas at outspan, in sand, 9243. Between Aintsas and Achterfontein at 2nd outspan, 9237. Nomtsas, 9332. Below Ababes, in bed of Tsondeb River, 9156.
- Geigeria pilifera*, Hutchinson. Between Tsondeb and Great Fish River, on shale-slopes, 9294. North of Aintsas at outspan, in sand, 9240.
- Ondetia linearis*, Benth. Bull's Mouth Pass, 8948. Between Tsubgaus and Ganaams, on shale-slopes, 9389.
- Eriocephalus pubescens*, DC. Between Haris and the Awas Mountains, on high plateau, 9686. Awas Mountains, 12 km. east of Windhuk, on quartzite slopes, 9603.
- Pentzia annua*, DC. (*Matricaria albida*, Fenzl.). Holoog, in bed of Great Fish River, on drying sand, 9801.
- Pentzia virgata*, Less. North of Areb, on sandy plains, 9475. At Kubib, 9490. 10 km. north-west of Nomtsas, on sandy banks of Usib River, 8982.
- Pentzia acutiloba*, Hutchinson. Great Fish River bed, 9278.
- Pentzia monocephala*, Sp. Moore. South of Choaberib, on stony plains, 9460. Naukluft Mountains, between Goas and Kabiras, on river-banks, 9074. Between Haris and the Awas Mountains, on high plateau, 9676.
- Pentzia lanata*, Hutchinson. Bull's Mouth Pass, 8946. Between Gamis and Bull's Mouth Pass.
- Senecio Marlothianus*, O. Hoffm. Windhuk, on shale-slopes, 9622. Below Ababes, on breccia-banks of Tsondeb River, 9152. Above Ababes, in bed of Tsondeb River, 9132.
- Tripteris microcarpa*, Harv. Bull's Mouth Pass, 8916.
- Tripteris pachypteris*, Harv. Between Nauchas and Areb, on granite in stream-bed, 9016.
- Osteospermum muricatum*, DC. Nauchas, in river-bed, 9047. Between Goas and Kabiras, in river-bed, 9085.
- Dimorphotheca polyptera*, DC. In bed of Great Fish River, 9276.
- Arctotis staechadifolia*, Berg. Nauchas, in river-bed, 9005.

Berkheya Schenckii, O. Hoffm. Naukluft Mountains, near Homnus, in river-bed, 9112.

Dicoma capensis, Less. North of Freistadt on the road to Tsubgaus, on high plateau, 9393.

CAMPANULACEAE.

Wahlenbergia arenaria, A. DC. Haris, in Kuisib River bed, 9513.

Wahlenbergia sp. (not in flower). Ababes, on broken granite, 9177.

Prismatocarpus sp. Naukluft Mountain, at Kabiras, on granite, 9060.

PLUMBAGINACEAE.

Plumbago Pearsonii, L. Bolus. Naukluft Mountains, in river-bed between Goas and Kabiras, 9080. Bull's Mouth Pass, 8952.

Vogelia africana, Lam. Above Ababes, in bed of Tsondeb River, 9122.

EBENACEAE.

Royena pallens, Thunb. Keetmanshoep, common in sandy places, 9244. Kubib, 9491. 8 km. north-west of Nomtsas, on banks of Usib River, 9329.

Euclea lanceolata, E. Mey. Awas Mountains, 12 km. east of Windhuk, on quartzite slopes, 9611, 9799. Naukluft Mountains, conspicuous on north-eastern slopes, 9091. North of Nauchas, 9008. Awas Mountains, between Aub and Windhuk, 9655.

ASCLEPIADACEAE.

Cryptolepis decidua, N.E. Br. North of Geitsigubib, on dry shale-plains, 9257. Nomtsas, on dry shale-slopes, 9312. Between Satansplatz and Voigtsgrund, 9360. Little Karas Mountains, western foothills at Holoog, 9764.

Raphionacme Burkei, N.E. Br. Awas Mountains, 12 km. east of Windhuk, on quartzite-slopes, 9797. Between Choaberib and Gurumanas, on stony and sandy veld, 9417.

Asclepias fruticosa, Linn. Gurinaris, in sand of river-beds, 9248.

Pergularia gariensis, N.E. Br. Ganaams, on shale-banks of Leber River, 9382. Below Ababes, in bed of Tsondeb River, 9142.

Tylophora Fleckii, N.E. Br. Naukluft Mountains, Kabiras, 9059.

Orphanthera albida, Schinz. Ababes, on rocks, 9199.

Microlooma longituba, Schltr. Gurumanas, 9422. North of Nauchas, on plains, 9009.

Caralluma lutea, N.E. Br. Nauchas, among granite, 9499.

Caralluma? n. sp. undeveloped. Nauchas, among granite, 9898.

HYDROPHYLLACEAE.

Codon Royeni, Linn. Naukluft Mountains, between Bull's Mouth Pass and Ababes, in river-bed, 9197.

BORAGINACEAE.

- ? *Cordia* sp. (material very incomplete). Below Ababes, on breccia-banks of Tson-dab River, 9147.
- Ehretia hottentotica*, Burch. Between Haris and the Awas Mountains, on high plateau, 9680. North of Hoffnungsfelde, on stony plateau, 9522. Gurumanas, on outcrop of quartz, 9424. 8 km. north-west of Nomtsas, on banks of Usib River, 9322.
- Heliotropium ovalifolium*, Forsk. Above Ababes, in bed of Tson-dab River, 9124. Great Fish River, between Gibeon and Freistadt, in sand, 9211.
- Heliotropium strigosum*, Willd. Little Karas Mountains, western foothills near Holoog, on shale-slopes, 9753. Below Ababes, on breccia-banks of Tson-dab River, 9154.
- Heliotropium supinum*, Linn. Ganaams, on sandy bed of Leber River, 9373.
- Tournefortia tuberculosa*, Cham. Between Voigtsgrund and Brekdorn, among stones in minor stream-bed, 9354. 8 km. north-west of Nomtsas, shale-ledges in Usib River bed, 9301. South of Choaberib in stream-bed, 9443. Above Ababes, in bed of Tson-dab River, 9128.
- Trichodesma africanum*, R. Br. Above Ababes, in bed of Tson-dab River, 9123.
- Trichodesma angustifolium*, Harv. Between Hoffnungsfelde and Haris, on plateau, 9531. Naukluft Mountains, near Homnus, on dried mud banks of river, 9110.
- Welstedia Dinteri*, Pilger. Between Gellap and Great Fish River, on dry shale-slopes, 9291.
- Anchusa capensis*, Thunb. Nauchas, in river-bed, 9004.

CONVOLVULACEAE.

- Ipomoea argyreoides*, Choisy. North of Gurumanas, in sand, 9572. Haris, 9560.
- Ipomoea fragilis*, Choisy. Awas Mountains, at Klein Windhuk, on quartzite-slopes, 9793.
- Ipomoea adenioides*, Schinz. 8 km. north-west of Nomtsas, in bed of Usib River, 9307. Below Ababes, in bed of Tson-dab River, 9149. North of Areb, on sandy plains, 9472.
- Ipomoea Bolusiana*, Schinz. (*I. angustisecta*, Engl.). At Areb, on stony slopes, 9033. Awas Mountains, 12 km. east of Windhuk, on quartzite-slopes, 9604. Between Hoffnungsfelde and Haris, stony places on plateau, 9552. Between Haris and the Awas Mountains, on high plateau, 9691.
- Convolvulus ulosepalus*, Hall. f. Naukluft Mountains, between Goas and Kabiras in river-bed, 9983. Between Hoffnungsfelde and Haris, in river-bed, 9553. Kubib in vleis-ground, 9483. Nauchas, on banks of Kam River, 9043.
- Convolvulus* sp. Haris, Kuisib River bed, 9562.

Convolvulus sp. Ukos, 9427.

Evolvulus alsinoides, Linn. Awas Mountains, 12 km. east of Windhuk, on quartzite-slopes, 9794.

Merremia palmata, Hall. f. Between Hoffnungsfelde and Haris, in river-bed, 9532. Awas Mountains, 12 km. east of Windhuk, on quartzite, 9789.

SOLANACEAE.

Solanum capense, Linn. var. *tomentosa*, C. H. Wright. Above Ababes, in bed of Tsondeb River, 9131. Bed of Great Fish River, 9268.

Solanum incanum, Linn. Nauchas, 9051.

Solanum rigescens, Jacq. forma. Haris, on stony plateau, 9555.

Solanum supinum, Dun. var. *occidentale*, nov. var. *foliis multo minus divis.* Between Haris and the Awas Mountains, on high plateau, 9693.

Solanum coccineum, Jacq. var. *inermis* nov. var. Windhuk, shale-slopes, 9639, 9771, 9770.

Solanum rigescens *toides*, Hutchinson. Windhuk, shale-slopes, 9772.

Solanum sp. At Ganaams, on banks of Leber River, 9376.

Solanum sp. At Ganaams, on shale-banks of Leber River, 9383. Little Karas Mountains, western foothills, at Holoog, 9763.

Datura Metel, Linn. Great Fish River, sandy bed, near farm, 9214.

Lycium Schäferi, U. Damm. (e descr.). South of Choaberib, on sandy plains, 9462.

Lycium carnosum, Poir. Namseb, on hard clay plain, 9338.

Lycium karasbergense, L. Bolus. At Witkobus, on saline flat, 8958.

Lycium austrinum, Miers. Awas Mountains, at Aub, 9518.

Lycium namaquense, U. Damm. Holoog, in sand, 9715.

Lycium hirsutum, Dun. 8 km. north-west of Nomtsas, on sandy banks of Usib River, 9325. At Kubib, on vlei-ground, 9479. North of Ukos, banks of stream-bed, 9429.

Lycium sp. Awas Mountains, at Aub, 9519.

Lycium sp. 8 km. north-west of Nomtsas, on banks of Usib River, 9319.

Lycium sp. Between Hoffnungsfelde and Haris, sandy places on plateau, 9533.

SCROPHULARIACEAE.

Aptosimum arenarium, Engl. Awas Mountains, 12 km. east of Windhuk, on quartzite-slopes, 9612.

Aptosimum depressum, Burch. Between Achterfontein and Gelwater, on sand-dunes, 9238. Between Nakop and Upington, on red sand, 9706.

Aptosimum abietinum, Burch. 8 km. north-west of Nomtsas, in Usib River bed, 9302. South of Gurinaris, on plains, 9254. Between Tsubgaus and Ganaams, in minor stream-bed, 9385.

Aptosimum lineare, Marl. and Engl. Little Karas Mountains, western foot-

hills near Holoog, 9759. Between Hoffnungsfelde and Haris, on plateau, 9539.

Aptosimum Steingroeveri, Engl. Keetmanshoep, 9282.

Aptosimum albomarginatum, Marl. and Engl. Between Nauchas and Areb, 9002. At Kubib, on sandy plains, 9495.

Peliostomum leucorrhizum, E. Mey. Near Gamis, on sandy banks of head streams of Great Fish River, 8967. 8 km. north-west of Nomtsas, on sandy banks of Usib River, 9318. South of Choaberib, on sandy plains, 9455. Bull's Mouth Pass, 8949.

Peliostomum origanoides, E. Mey. North of Aintsas, 9239.

Anticharis scoparia, Hiern. Little Karas Mountains, western foothills, near Holoog, on shale-slopes, 9733.

Nemesia lilacina, N.E. Br. Haris, in Kuisib River bed, 9512. Nauchas, near Kam River, 9050.

Freylinia sp. Awas Mountains, on quartzite, 12 km. east of Windhuk, 9602. Awas Mountains, pass between Haris and Aub, 9657.

Sutera atropurpurea, Hiern. Between Nauchas and Areb, in stream-bed, 9018. Between Haris and the Awas Mountains, on high plateau, 9508. South of Choaberib, on sandy plains, 9442.

Sutera sessilifolia, Hiern. Little Karas Mountains, western foothills near Holoog, on shale-slopes, 9750.

Sutera canescens, Hiern. Between Tsubgaus and Ganaams, in minor stream-bed, 9380. South of Choaberib, on stony bank of stream-bed, 9449. Windhuk, on shale-slopes, 9626. Between Choaberib and Gurumanas, in river-bed, 9418. At Kubib, in vleiground, 9481. Naukluft Mountains, near Goas, in river-bed, 9073. Below Ababes, in bed of Tsondeb River, 9157.

Sutera sp. Dry ravines on right bank of Great Fish River, 9217. Naukluft Mountains, river-bed between Goas and Kabiras, 9076.

Sutera sp. Locality uncertain, 9896.

Manulea sp. (material insufficient). Holoog, in bed of Great Fish River, on drying sand, 9804.

Manulea sp. Kuisib River bed, at Haris, 9516.

BIGNONIACEAE.

Rhigozum trichotomum, Burch. Gamis, on plains, 8964.

PEDALINACEAE.

Harpagophytum procumbens, DC. Between Gamis and Bull's Mouth Pass, 8930. North of Kubib, on plains of granitic sand, 9431. Between Choaberib and Gurumanas, on sandy plains, 9415. Windhuk, on shale-slopes, 9643.

Rogeria longiflora, Gay. Little Karas Mountains, western foothills near Holoog, on shale-slopes, 9749. At Holoog on banks of Great Fish River, 9805.

ACANTHACEAE.

- Dyschoriste Guerkeana*, Schinz. Gurumanas, 9420.
- Dyschoriste Fischeri*, Lindau. Between Nauchas and Aub, among granite blocks, 9021.
- Petalidium Gossweileri*, Sp. Moore. Between Tsubgaus and Ganaams, in minor stream-bed, 9388. Between Gelwater and Great Fish River, on shale, 9223, 9295. Below Ababes, in bed of Tsondeb River, 9140. Bull's Mouth Pass, 8950.
- Blepharis diversispina*, C. B. Clarke. Between Gellap and the Great Fish River, on dry shale-slopes, 9289. Ababes, on granitic gravel, 9171.
- Blepharis furcata*, Pers. Little Karas Mountains, western foothills near Holoog, on shale-slopes, 9756.
- Blepharis* sp. nearest *B. diversispina*, C. B. Clarke (material incomplete). Naukluft Mountains, between Ababes and Homnus, on plains of granitic sand, 9096.
- Barleria irritans*, Nees. Awas Mountains, 12 km. east of Windhuk, on quartzite-slopes, 9795.
- Barleria Prionitis*, Linn. Bull's Mouth Pass, 8918.
- Barleria lancifolia*, T. Anders. Naukluft Mountains, Kabiras, in clefts in granitic block, 9056. Awas Mountains, 12 km. east of Windhuk, on quartzite-slopes, 9606. Between Bull's Mouth Pass and Ababes, in sandy river-bed, 8904.
- Monechma divaricatum*, C. B. Cl. Between Bull's Mouth Pass and Ababes, in ravines, 8905.
- Monechma spartioides*, C. B. Clarke. Great Fish River, on shale-banks, 9265.
- Monechma molle*, C. B. Clarke. Little Karas Mountains, western foothills near Holoog, sandy banks of minor stream, 9738.
- Monechma genistaefolium*, C. B. Clarke. Great Fish River, on shale-slopes, 9266. North of Freistadt, on the road to Tsubgaus, on high plateau, 9394. Little Karas Mountains, western foothills, on shale-slopes, 9721. Outspan at Aintsas, 9242, 9241.
- Monechma arenicola*, C. B. Clarke. Below Ababes, in bed of Tsondeb River, 9146. Naukluft Mountains, between Goas and Nauchas, in river-bed, 9075. Bull's Mouth Pass, 8915.
- Hypoestes Forskalei*, R. Br. Awas Mountains, between Aub and Windhuk, 9653.

SELAGINACEAE.

- Selago albida*, Choisy? (material insufficient). At Kubib in vleiground, 9482.

VERBENACEAE.

- Lantana salvifolia*, Jacq. Between Haris and the Awas Mountains, 9505.
- Lippia* sp. Between Nauchas and Areb, 9026.
- Lippia* sp. Haris, stony plateau, 9556.

Bouchea glandulifera, H. H. W. Pearson. Little Karas Mountains, western foothills, on shale-slopes, 9723. Between Gurinaris and Achterfontein, on sandy plains, 9247. Above Ababes, on sandy banks of Tsondeb River, 9190.

Bouchea pinnatifida, Schauer. Between Gamis and Bull's Mouth Pass, in river-bed, 8942. West of Gamis Farm House, on hill, 8975. Awas Mountains, 12 km. east of Windhuk, 9609. Between Kabiras and Nauchas, 9039. Hoffnungsfelde, 9583.

LABIATAE.

Salvia stenophylla, Burch. Nauchas, on banks of Kam River, 9044.

Salvia rugosa, Thunb. Between Nauchas and Areb, in stream-bed, on granite, 9015.

Ocimum fruticulosum, Burch. Between Voigtsgrund and Brekdorn, in river-bed, among stones, 9351. Gamis, river-bed, 8980. Windhuk, shale-slopes, 9635. Hoffnungsfelde, sandy slopes, 9588.

Stachys spathulata, Burch. Between Nauchas and Areb, on sandy river-bed, 9012.

Leucas altissima, Engl. Gibeon, on dry hills, 9206. Naukluft Mountains, between Bull's Mouth Pass and Ababes, in sandy bed of river, 8903.

Leucas altissima, Engl. forma. Windhuk, shale-slopes, 9640.

Leonotis sp. 8 km. north-west of Nomtsas, on sandy banks of Usib River, 9323. Naukluft Mountains, between Goas and Kabiras, in river-bed, 9087.

NYCTAGINACEAE.

Boerhaavia pentandra, Burch. Awas Mountains, at Aub, 9517. Nauchas, 9046. At Kubib, on vleiground, 9494.

Boerhaavia repens, var. *diffusa*, Hook. f. Ababes, in broken granite, 9176.

Phaeoptilon spinosum, Radlk. North of Gibeon, in bed of Great Fish River, 9209.

Microtea Burchellii, N.E. Br. Between Voigtsgrund and Brekdorn, among stones in river-bed, 9352.

ILLECEBRACEAE.

Corrigiola litoralis, Linn. Between Haris and the Awas Mountains, on high plateau in sandy places.

AMARANTACEAE.

Hermestaedia elegans, Moq. South of Choaberib, among stones in river-bed, 9454.

Sericocoma avolans, Fenzl. Little Karas Mountains, western foothills at Holoog, 9761. Between Nakop and Upington, in red sand, 9707. Above Ababes, in Tsondeb River bed, 9185.

- Aerva leucura*, Moq. Naukluft Mountains, between Goas and Kabiras, in river-bed, 9071.
- Calicorema capitata*, Hook. f. At Ababes, in bed and on banks of Tsondeb River, 9139. South of Ganaams, on dry shale, 9250. Bull's Mouth Pass, 8920.
- Marcellia Bainesii*, C. B. Clarke. Between Aub and Windhuk, on slopes, 9650. Bull's Mouth Pass, 8947. Little Karas Mountains, western foothills near Holoog, on shale-slopes, 9726.

CHENOPODIACEAE.

- Chenopodium album*, Linn. Near Gamis, on sandy banks of head stream of Fish River, 8969.
- Atriplex Halimus*, Linn. At Witkobus, river-flats, 8984.
- Atriplex rosea*, Linn. Windhuk, 9777.
- ? *Kochia* sp. (no flowers). Witkobus, sandy saline river-banks, 8960.
- Suaeda fruticosa*, Forsk. Tsubgaus, sand-dunes of Leber River, 9203.
- Salsola aphylla*, Linn. f. Between Achterfontein and Gelwater, on sand-dunes, 9203.

POLYGONACEAE.

- Polygonum aviculare*, Linn. At Ganaams, in sandy bed of Leber River, 9371.
- Polygonum* sp. Nauchas, bed of Kam River, 9042.
- Rumex Ecklonianus*, Meisn. At Kubib, vlel, 9493.

LORANTHACEAE.

- Loranthus ovalis*, E. Mey. Great Fish River at Holoog, 9807.
- Loranthus undulatus*, E. Mey. Above Ababes, in Tsondeb River bed, 9183. Great Fish River, 8907. Between Gellap and Great Fish River, 9290.
- Loranthus oleaefolius*, Cham. and Schlecht. Windhuk, 9634.
- Viscum rotundifolium*, Linn. f. North of Kubib Vlei, 9434.
- Viscum MacOwani*, Engl. Bull's Mouth Pass, 8927. Between Gamis and Bull's Mouth Pass, Upper Fish River System, 8929.

SANTALACEAE.

- Thesium lacinulatum*, A. W. Hill. Awas Mountains, 12 km. east of Windhuk, on quartzite, 9610.
- Thesium cruciatum*, A. W. Hill. North of Areb, on sandy plains, 9474. South of Choaberib, on plains, 9447.
- Osyris abyssinica*, Hochst. Between Haris and the Awas Mountains, on high plateau, 9679.

EUPHORBIACEAE.

- Euphorbia glauca*, Pax. Ababes, on granitic gravels, 9169, 9168. Above Ababes, on sandy banks of Tsondeb River, 9192, 9130.
- Euphorbia Pfeilii*, Pax. Naukluft Mountains, between Ababes and Homnus,

9106. North of Freistadt, on road to Tsubgaus, on high plateau, 9397. Ababes, on granitic gravels, 9167.

Euphorbia indecora, N.E. Br. North of Areb, on plains, 9477. Between Haris and the Awas Mountains, on high plateau, 9682. Between Gurumanas and Hoffnungsfelde, on plateau, 9587. Between Kabiras and Nauchas, 9036.

Euphorbia gariiepina, Boiss. Between Ukis and Choaberib, on quartzite, 9439.

Euphorbia lignosa, Marloth. Between Kabiras and Areb, 9473. Below Ababes, on banks and in bed of Tsondeb River, 9138.

Euphorbia frutescens, N.E. Br. Ababes, on breccia-banks of Tsondeb River, 9119, 9164.

Phyllanthus Burchellii, Müll Arg. Ababes, on granitic gravels, 9170. Windhuk, in rock-crevices, 9768. Between Voigtsgrund and Brekdorn, among stones in river-bed, 9353.

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Ornithogalum sp. Gamis, 8972.
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- Eragrostis annulata*, Rendle. Little Karas Mountains, western foothills near Holoog, in sandy river-bed, 9729. Holoog, in bed of Great Fish River, 9702.
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NOTES ON THE FUNCTION OF THE STAMINAL AND STAMINODAL GLANDS IN THE FLOWERS OF *ADENANDRA*

BY R. MARLOTH, PH.D.

(With illustration on Plate I)

AMONG the various natural groups of plants which are entirely or principally confined to the south-western coast lands of the Cape one of the most important in several respects is the tribe DIOSMEAE, family RUTACEAE. The tribe consists of about 200 species, of which only one is a tree, viz. *Calodendron capense*, the Cape chestnut, all the others being shrubs or shrublets, mostly only a foot or two high and all bearing ericoid or myrtilloid leaves richly endowed with aromatic oils. Some of the species are so frequent on the flats or on the hills and mountains that sometimes whole valleys may be filled with their fragrant exhalation.

The best known representatives of the tribe are the Buchu plants, of which two are employed on a larger scale, viz. *Barosma betulina* and *B. crenulata*, the former being the more highly priced of the two.

Generally speaking the flowers are mostly small although often conspicuous through their number, as in the so-called Cape may (*Coleonema album*), but in the genus *Adenandra* they are quite showy, and several species indicate this in their vernacular name, viz. Shepherd's delight (*A. serpyllacea*), Klip sissie (*A. fragrans*), Kommetje teewater (*A. uniflora*), etc.

It is a peculiar feature in the structure of the flowers of this genus which forms the subject of these notes.

The flower possesses five perfect stamens and, alternating with them, five sterile stamens termed staminodes, the latter generally resembling the stamens but possessing no anthers. Each of these organs, stamens as well as staminodes, bears a gland at its apex which secretes a viscid fluid, and as the glands are also often bright red, it is not surprising to find that they have often been looked upon as organs of attraction for insect visitors, that is to say, as something in the nature of nectaries. As our observations will show, that is not their function, for the real nectaries which secrete a saccharine fluid for the attraction of insects are situated in the base of the flower and consist of little depressions just in front of the staminodes (Fig. A, 6). The question arises, what is the function of these conspicuous secretory organs?

An investigation of the chemical nature of the secretion of both kinds of

glands, viz. staminal as well as staminodal, shows that the secretion does not contain any sugar, but that it is a kind of balsam, similar in its nature to the viscid coating of the flowers of some heaths, e.g. *Erica blenna*, *E. regia*, *E. physodes* (white sticky heath of Table Mountain), etc., and the viscid secretion of the glands on the leaves of *Roridula dentata*¹. But while in these cases the viscid fluid affords protection against creeping insects it has quite a different function in the flowers of *Adenandra*. The flowers are strongly protandrous. When the bud opens the staminodes connive towards the centre of the flower and their glands are viscid, while the stamens stand erect outside of the staminodes, their anthers being still closed and the apical glands erect and dry (Fig. A, 2). Then one stamen after another, with an interval of a day or two, moves its anther towards the centre, the anther-cells split open, the apical gland reclines on the back of the anther and becomes viscid, while the pollen is finally deposited on the top of the curved style, the stigma being at this stage undeveloped and pressed against the ovary (Figs. A, 4 and 7). When all the anthers have discharged their pollen, the secretion of viscid balsam ceases, staminodes and anthers shrivel up, the style begins to stretch itself until it is erect, and the stigma, large and fully developed, stands upright in the centre of the flower (Fig. A, 8). In *Adenandra uniflora* each flower requires several days or a week to complete this development, and it is obvious that the viscid fluid can serve only one purpose, viz. to act as an adhesive by means of which the pollen is firmly attached to the mouth-parts of the visiting insects while they force their head in between the stamens and staminodes in order to reach the honey in the base of the flower, thus compelling the visitor to carry the pollen to an older flower where the stigma is in its receptive stage.

The elaborate structure of the flower and the complicated movements during its anthesis are consequently the means of securing the cross-pollination of the flowers.

As far as our observations go, all species of *Adenandra* are constructed on more or less the same plan, although some less elaborately than others. The number of insects actually observed by us on the flowers of various species is, however, very small—an experience recurring in numerous other groups. It is extraordinary that on bright sunny days one may be among patches of *Adenandra uniflora* with perhaps hundreds of its brilliantly white flowers and not see a single insect visiting them. However, we have observed two kinds of flies with long proboscis (*Pangonia*) and two beetles, viz. *Anysonyx Ursus* and another one, and on one occasion also a bee, although such short-tongued insects could not reach the nectar at the base of the flower but would only gather the pollen.

¹ R. Marloth, *Trans. Roy. Soc. S.A.* 1910, p. 59.

A NOTE ON, AND A DESCRIPTION OF FOUR NEW SPECIES AND TWO NEW VARIETIES OF THE GENUS *ADENANDRA*, WILLD.

BY R. A. DUMMER.

AN examination of the material of this genus was undertaken largely at the instigation of Mrs Bolus, Hon. Curator of the Bolus Herbarium. The material examined embraces that at the S.A. Museum and the Bolus Herbarium. The private collections of Drs W. Froembling and R. Marloth, and Mr J. Lamb have also been consulted. The S.A. Museum Herbarium is fairly rich in the types of Ecklon and Zeyher, not only of *Adenandra* but of *Agathosma* and allied genera, which has thus materially aided the work of comparison and identification. With the exception of *A. Krausii*, Meisn., and *A. ciliata*, Sond., all the species maintained by Sonder are represented in the local Herbaria.

Recently described species are *A. Bodkinii* and *A. acuta*, of Schlechter, *A. Sonderi* and *A. Bolusii*, of Dummer, and *A. Villiersii*, Phillips.

The first and third are very distinct; the second may hereafter prove to be a variety of *A. cuspidata*, Mey., or *A. amoena*, B. and W. (the two species have been confused). *A. Bolusii* I am compelled to refer to *A. humilis*, E. and Z. (the type of the latter being in the S.A. Museum), and *A. Villiersii* is probably only a southern and smaller-leaved form of *A. coriacea*, Lichst. *A. macradenia*, Sond., as also *Diosma teretifolia*, Link., are referred to the genus *Acmadenia*. *A. Fryii*, *A. rotundifoliae* affinis, sed habitu nano, foliis patentibus, fere eglandulosis, floribus in capitulo paucioribus, calyce profunde partito, lamina petali brevioris, ceterisque distinguitur.

Fruticulus decumbens?, parce ramosus, ramulis brevibus, dense foliosis, obtuse angulatis, minute patenterque puberulis. Folia patentia vel recurva, petiolata, petiolo complanato adpresso; lamina interdum orbicularis, saepe elliptica, apice recurva, callosa-apiculata, 3—6 mm. longa, 2—3 mm. lata, crasse coriacea, pallide viridis, glabra, subtus pallidiora, eglandulosa, costa lata fere immersa, margine paullulo revoluta, distanter glanduloso-crenulata. Capitula 2—4-flora, 1.5 cm. diam., floribus subsessilibus, purpureo-albidis (sicco), bracteis foliosis, apicem versus coloratis, inferne ciliolatis. Calyx 7—8 mm. longus, utrinque glaber, purpureus (sicco), segmentis oblongis obtusis vel

rotundatis ecarinatis eciliolatisque. Petala spatulata, toto 8 mm. longa, 2—2.2 mm. lata, utrinque glabra, limbis ellipticis acutis. Stamina parce pubescentia; staminodia anguste oblonga, 4 mm. longa, alba-pilosa.

Cape Province: South-Western Region; Bredasdorp Div.; Wagenhuis Kraal, Marcus Bay, Feb.—June, 1900, *Harold Fry*, Herb. Bolus, 4951!

Allied to *A. rotundifolia*, E. and Z. (of which Ecklon and Zeyher's types are in the S.A. Museum, this rare plant not having been discovered within recent years), but at once distinguished by its more dwarf habit, and non-viscid nature, patently spreading recurved leaves which are glandless and almost nerveless dorsally, by its few-flowered heads (2—4 flowers), deeply cleft calyces and shorter petal limbs. The leaf-nerve, when apparent, is usually very broad and sunken.

A. caledonensis, *A. viscidæ* affinis, sed floribus minoribus, breviter pedicellatis, vix viscidis, calyce conspicue glanduloso-punctato, intus glabro, lamina petali basi fere truncata, unguibus latioribus, ceterisque differt.

Fruticulus gracilis, erectiusculus, ad 0.3 m. altus, ramis saepe simplicibus, e basi foliatis, inferne brunneis, superne griseo-citrinis, glabris. Folia inferne patentia, superne ascendentia, breviter petiolata, oblongiuscula vel elliptica, obtusa vel callosa-apiculata, 5—8 mm. longa, 2.5—3.5 mm. lata, crasse coriacea, utrinque glabra, pallide viridia, subtus eglandulosa et vix costata, margine incrassata-revoluta, obscure impresso-glandulosa. Capitula 2—5-flora, circiter 2 cm. diametro, floribus albidis (sicco); pedicelli breves, 2—3 mm. longi, glabri; bracteolae binae medio positaе, cuneatae incrassato-apiculatae, concavae, glabrae, 3 mm. longae. Calyx 5—6 mm. longus, glaber, segmentis oblongo-triangularibus obtusiusculis, dorso purpureo-glanduliferis, apicem versus carinatis, purpureis. Petala late unguiculata, 8—10 mm. longa, limbis e basi cuneatis vel fere truncatis, late ovatis vel late obovatis, apice rotundatis, utrinque glabris, unguibus parvisissime albo-pubescentibus. Stamina parvisissime pubescentia, staminodia 4 mm. longa, patenter albo-hirsuta, glandulis exceptis.

Cape Province: South-Western Region; Caledon Div., sandy places near Hermanus, Oct. 1903, *H. Bolus*, 9680, in Herb. Bolus!

Nearest to *A. viscida*, but differing in its slightly more slender habit, creamy greyish twigs, relatively shorter elliptic (scarcely oblong) paler greenish leaves, with less prominent, at times almost obsolete dorsal midribs, in the relatively smaller shortly pedicelled flowers (not subsessile and scarcely viscid), the conspicuously glandularly punctate calyx, glabrous and not sparsely pilose within, the limbs of the petals almost truncate basally, and scarcely cuneate, in their broader claws, and the less hirsute staminodes.

A. viscida, E. and Z., var. *ciliata*.

Folia valde revoluta, primo albo-ciliata, pilis saepissime 2 mm. longis. Calyx dorso purpureo-punctato-glandulosus, lobis pectinato-ciliatis. Staminoa hirsutula.

Cape Province: South-Western Region; Bredasdorp Div., rocky hill towards Bredasdorp (Elim), 600 ft., July, 1895, *F. Guthrie*, 3847! (in Herb. Bolus).

A variety of *A. viscida*, E. and Z., distinguished by the more revolute leaves, the lower being conspicuously long-ciliate, the more markedly glandular punctation of the calyx, its ciliate lobes, and the less hirsute staminodes.

A. Pottsii, *A. uniflorae* affinis sed foliis viscidulis ovatis, apice uncinatis, marginibus haud revolutis, lobis calycis obtusioribus, conspicue reticulatis, ceterisque differt.

Fruticulus humilis, ad 15 cm. altus, parce divaricato-vel dichotomo-ramosus, inferne nudus, nigrescens, superne foliosus, ramulis brevibus, erectiusculis vel curvatis, circ. 3 mm. longis, imbricato-foliatis, citrinis, patenter pubescentibus. Folia imbricata, apice uncinato-recurva, subsessilia, viscidula; lamina ovata, subacuminata, 3—5 mm. longa, 2.5—3 mm. lata, coriacea rigidaque, utrinque glabra, supra viridis, subtus pallidiora, punctato-glandulosa, fere carinato-costata, margine incrassata paullulo crenulato-glandulosa. Flores solitaires, vel umbellae 2-florae, floribus pallide roseis (sicco), pedicellis foliosis ad 5 mm. longis, bracteis inferne ciliatis. Calyx 8 mm. longus, lobis late ovatis 4 mm. latis, cuspidato-acutis, intus parvis adpresso-pubescentibus, extus glabris, obscure punctato-glandulosis, marginibus pectinato-ciliatis, apicem versus glabris, crenulatis. Petala breviter unguiculata, 1 cm. longa, glabra, limbo orbiculari vel fere reniformi, 8 mm. lato. Staminoa filiformia, 3.5—4 mm. longa, albo-pilosa.

Cape Province: South-Western Region; Stellenbosch Div., Stellenbosch, Oct., 1911, *Dr G. Potts*, 1390! (in Herb. Bolus).

Obviously related to *A. uniflora*, Willd., but differing in its branching system, imbricate to subimbricate relatively shorter and more ovate viscidulous leaves with a recurved hook-like apiculus, and not revolute though thickened margins, in the more rosy coloured flowers (often in twos), differently shaped bracts, more obtuse conspicuously reticulated calyx lobes, and more orbicular petal-limbs.

A. biseriata, Meyer, var. *gracilior*.

Folia vix coriacea, primo valde pilosa. Umbellae 1—2-florae, pedicellis gracilibus, ad 1.5 cm. longis glabris, medio bi-bracteolatis, bracteolis foliatis, 2—3 mm. longis. Calyx utrinque glaber, 6 mm. longus, lobis ovatis obtusiusculis, dorso vix glandulosis, apicem versus obtuse carinatis. Petala breviter unguiculata, 8 mm. longa, limbo

late obovato vel fere quadrato, 5 mm. lato, unguibus parce ciliolatis. *Staminodia* late filiformia, hirsutula.

Cape Province: South-Western Region; Caledon Div., on the northern slope of a mountain near Houw Hoek (a solitary specimen), 1700 ft., Oct., 1885, *H. Bolus* in Herb. Bolus, 7477!

A peculiar variant (if a variant?), differing from typical *A. biseriata* in its slender and laxer habit, pilose leaves, long-pedicelled much smaller flowers, with glabrous calyx, scarcely punctate-glandular dorsally, and differently shaped petals with stronger claws. The two rows of dorsal leaf-glands assign it to *A. biseriata*, but its laxer habit and smaller flowers suggest affinities with *A. serpyllacea* or one of its allies. Perhaps a natural hybrid!

A. Guthriei, *A. lasianthae* affinis, sed foliis dorsaliter omnino eglandulosis, brevioribus latioribusque, pedunculis gracilioribus, staminodiis per totam longitudinem parce pubescentibus, pilis patentibus, ceterisque differt.

Fruticulus gracilis, erectus, saepe eramosus, interdum superne parce verticillatim-ramosus, foliosus, 0.3 m. altus, ramuli citrini, parce patenter pubescentes. Folia ascendentia, imbricata vel subimbricata, elliptica, obtusiuscula, 6—8 mm. longa, 2.5—4 mm. lata, coriacea rigidaque, utrinque glabra, pallide ochraceo-viridia, dorso eglandulosa, obsolete complanato late costata, margine paullulo incrassata vix impresso-glandulosa. Umbellae 6—16-florae, 3—4 cm. diam., floribus albis purpureisque (teste Guthrie); pedicelli purpurei, patenter albo-villosi; bracteolae basilares, subulatae, albo-pubescentes, 2 mm. longae. Calyx 6 mm. longus, extus purpureus, albo-villosus, segmentis triangularibus, acutis, subscariosis, dorso vix carinatis, punctato-glandulosis, margine ciliatis. Petala breviter unguiculata, glabra, 9 mm. longa, limbis obovato-cuneatis apiculatis. Stamina 1.5 mm. longa, filamentis parce pubescentibus, staminodia 3 mm. longa, filamentis patenter albo-pubescentibus, glandulis nigro-purpureis glabris.

Cape Province: South-Western Region; Bredasdorp Div., rocky hill towards Bredasdorp (Elim), 300 ft., July, 1895, *F. Guthrie*, 3849! (in Herb. Bolus).

Differs from *A. lasiantha*, Sond. (which I only know from description, the specimen of Ecklon and Zeyher, so named in the S.A. Mus. Herb. being obviously incorrect) in the leaves being completely eglandular dorsally, and being relatively shorter and broader, and more elliptic or obovate-elliptic, in the more slender peduncles, the relatively smaller calyces, acute calyx-lobes, not so conspicuously glandular dorsally, in the relatively smaller petals, the limbs of which are more elliptic than suborbicular, and scarcely reddish at the back, and in the staminodes which are "not very hairy at the point," but sparingly patently pubescent throughout their entire length.

A FURTHER CONTRIBUTION TO OUR KNOWLEDGE OF THE GENUS *AGATHOSMA*, WILLD., CONTAINING DESCRIPTIONS OF 23 NEW SPECIES AND 3 NEW VARIETIES

By R. A. DUMMER.

My former paper on the genus *Agathosma*, which was based on all the relevant material in the Kew Herbarium, the South Kensington Museum, and the Linnean collections, appeared in Fedde's Repertorium, xi, 1912, pp. 321-337 and 401-423. At that time no opportunity was afforded me of examining the rich collections in the S.A. Herbaria, notably that of the Bolus Herbarium, and of the S.A. Museum Herbarium at Cape Town. The following descriptions of novelties are therefore the result of the examination of these collections as well as those of the Albany Museum (Grahamstown), the University of Stellenbosch, and of Drs R. Marloth and W. Froembling, C. Town, and of Mr J. Lamb of the Observatory.

Primarily it had been my intention to monograph this genus, but owing to lack of time, and my early departure to Uganda, and the difficulty of procuring the necessary types from Europe at the present time (about 40 types not being represented in the local Herbaria) this project had reluctantly to be abandoned. Among the *rarae aves* which have recently come to light again are *A. struthioloides*, mihi, *A. Dregeana*, Sond., *A. gonaquensis*, E. and Z., *A. nigromontana*, E. and Z., *A. filipetala*, E. and Z., *A. linifolia*, Lichst., *A. blaerioides*, Cham., *A. pubescens*, Sond., *A. Burchellii*, mihi, *A. pilifera*, Schlecht., *A. craspedota*, E. Mey., *A. recurvifolia*, Sond., *A. punctata*, Sond., *A. mucronulata*, Sond., *A. martiana*, Sond., *A. propinqua*, Sond., *A. gibbosa*, mihi, *A. lancifolia*, E. and Z., *A. rubra*, Willd., *A. decumbens*, E. and Z., *A. asperifolia*, E. and Z., which records serve to indicate, that although apparently extremely local in their distribution, these species happily have not suffered extinction. Six novelties have been described since the appearance of my first paper; these are *A. Sladeniana*, Glover, and *A. Muirii*, *A. alta*, *A. Dummeri*, *A. rotundipetala*, and *A. giftbergensis* of Phillips, all of which are apparently distinct with the exception of the latter, which I can only regard as a form of my *A. microcalyx* from the same locality.

The genus as at present conceived, with the descriptions of the present novelties, therefore comprises about 170 species.

In conclusion I have pleasure in expressing my thanks to the authorities

of the respective institutions, where I have been privileged to work, and to the private persons, whose collections I have had the loan of for examination. *Agathosma humilis*, Sond., var. *capitata*.

Fruticulus humilis, ad 15 cm. altus, ramis magis minusve simplicibus, fastigiatis dense foliosis. Folia subulato-lanceolata, 4—5 mm. longa, 1—1.2 mm. lata, supra concava glabraque, dorso convexa, rugulosa, albo-pilosa. Umbellae capitatae, albiae, circiter 1 cm. diam., densiflorae; pedicelli breves, 1—1.5 mm. longi, bracteolis binis subulatis 1.7—2 mm. longis. Calyx circ. 2 mm. longus. Petala 5—6 mm. longa, limbis oblongiusculis, apice subcucullatis, glabris, unguibus pilosis; staminodia filiformia, circiter 2 mm. longa, glabra. Pistillum glabrum, stylo crasse filiformi, dense patenter pubescenti.

Cape Province: South-Western Region; Clanwilliam Div., in sandy and rocky places, Grootberg, Cedarbergen, Sept. 1898; *C. L. Leipoldt* 893! (S.A. Museum Herb.).

The material of this variety was distributed as *Agathosma hirta*, B. and W., but its north-westerly origin does not favour this identification; moreover it belongs to a wholly different section, viz. *Pseudostemon*, and apparently is only a variety of *A. humilis*, Sond. (which I only know from description), and from which it differs in its relatively taller habit, very shortly pedicelled flowers, slightly longer calyxlobes, much shorter petals and glabrous ovary, though the style is, as in the type, patently pubescent. It has certainly the superficies of the species with which it has been confounded, but in *A. hirta* the disposition of the flowers is more racemose.

A. stilbeoides, *A. humili* affinis, sed foliis brevioribus latioribusque, utrinque puberulis, umbellis densis capituliformibus, segmentis calycis late spathulatis differt.

Fruticulus ad 20 cm. altus, inferne aphyllus, superne verticillatim ramosus, viscidulus, faciei *A. imbricatae* similis. Folia ascendentia, imbricata, brevissime petiolata, ovata vel elliptica, obtusiuscula, paullulo incurva, 2—3 mm. longa, 1—1.8 mm. lata, crassiuscula, supra concava, nitentia, minute puberula, dorso convexa, albo-puberula, eglandulosa. Umbella capituliformis, hemisphaerica, confertiflora, 7—10 mm. diam., floribus albidis, pedicelli perbreves ebracteolati?, bracteolae foliosae. Calyx profunde partitus, 2.5 mm. longus, segmentis late spatulatis, cucullato-rotundatis subscariosis, intus concavis, dorso puberulis, obtuse carinatis, apice gibboso-glandulosus, marginibus pectinato-ciliatis. Petala longe unguiculata, 4—6 mm. longa, limbis obovato-cuneatis, 1.5 mm. longis, glabris, unguibus pilosulis. Stamina glabra; staminodia adnata, late filiformia, ad 2 mm. longa, apicale glandula notata, pectinato-pilosula. Car-

pellum superne albo-puberulum, stylo filiformi, 5—6 mm. longo inferne parcellissime patenter-pilosulo.

Cape Province: South-Western Region; Clanwilliam Div., top of Sneeuwkop Mountain, 6000 ft; in rocky clefts, Jan., 1898, *Leipoldt*, 650! (in Herb. S.A. and Albany Museums, Bolus).

This plant, which mimics forms of *A. imbricata*, is assigned to the section *Pseudostemon* however, on account of its staminodia being attached to the claws of the petals. Its affinity is with *A. humilis*, from which it differs in its shorter, broader, more elliptic leaves, which are moreover puberulous on both sides, in the dense-flowered capitulate umbels, almost sessile flowers, and the broadly spatulate calyx-segments. The flowers I have examined are peculiar in maturing only one carpel.

The material was distributed as a form of *A. imbricata*, but the plant is distinguished from that species and its multifarious forms, by its relatively shorter, more thickish and more obtuse leaves, which are puberulous on both sides, have not the conspicuous dorsal gland-punctuation on the leaf nor the costate keel of the latter plant. *Leipoldt* states that the species is a low bush, very common, and has sweet smelling flowers.

Superficially not unlike a *Stilbe*, hence the specific name.

A. Foleyana, *A. humili* affinis, sed habitu decumbente, foliis glabris, pectinato-ciliolatis, floribus fere subsessilibus, calyce glabro, distinguitur.

Fruticulus decumbens, multipannosus, ad 20 cm. altus, ramis decumbentibus vel erectiusculis, simplicibus vel superne parce verticillatim ramosis, imbricato-foliosis, minute puberulis. Folia ascendentia vel fere adpressa, subimbricata, perbreve petiolata, elliptica, obtusa, circiter 4 mm. longa, 1—1.5 mm. lata, supra profunde concava, subtus convexa et obscure verruculoso-glandulosa, crasse coriacea, utrinque glabra, margine creberrime pectinato-ciliata. Umbella capitata, 5—10-flora, rosea, circiter 1 cm. diametro, bracteis foliatis vel coloratis, bracteolae basillares, binae, segmentis calycis simulantes, ad 2.5 mm. longi; pedicelli 1 mm. longi, pubescentes. Calyx 3—3.5 mm. longus, rubro-purpureus, segmentis late oblongis, subscariosis, apice perbreve cuspidatis, subcucullatis, intra concavis, extra carinatis, superne fere gibbosis, margine pectinato-ciliatis. Petala unguiculata, 5—6 mm. longa, laminis anguste obovato-ellipticis, glabris, unguibus parce pilosis. Stamina circiter 5 mm. longa, filamentis parcellissime pilosis; staminodia adnata, lanceolata, circiter 2 mm. longa, inferne parce pilosa. Pistillum superne breviter strigillosum, stylo filiformi, 5—6 mm. longo, omnino patenter piloso.

Cape Province: South-Western Region; Ceres Div., Matroosberg,

near Laaken Vlei, 7000 ft., Jan., 1917, *Dr E. P. Phillips*, 1964! (Herb. S.A. Museum, No. 11764).

One of the section *Pseudostemon*, though mimicking decumbent forms of *A. alpina*, Schlechter, from which the closely pectinate-ciliolate leaves and more numerous dorsal leaf-glands distinguish it immediately. Its affinity apparently lies with *A. humilis*, Sonder, from which its decumbent habit, glabrous leaves with pectinate ciliation, almost sessile flowers, glabrous calyces with differently shaped lobes, and rose-coloured and shorter petals separate it.

A. scaberula.

Fruticulus robustus, viscidulus, rigidus, circiter 15 cm. altus, dense divaricato-ramosus foliosusque; ramuli ultimi congestis, breves, subimbricato-foliosi, breviter strigillosi. Folia subsessilia, patula apice incurvata, ovata, subacuto-cuspidata, 3—5 mm. longa, 2—3 mm. lata, valde coriacea rigidaque, viscidula, supra glabra, nitida, subtus denticulato-scaberula, incrassato-costata, apice fere gibbosa, margine vix incrassata, creberrime hyalino-denticulata. Umbella capituliformis, densiflora, 1—1.3 cm. diametro, bracteis foliosis, floribus brevioribus; flores albi (sicco) subsessiles, bracteolis late filiformibus, 2—2.3 mm. longis, truncatis, pectinato-pilosulis. Calyx 3—3.5 mm. longus, segmentis oblongiusculis, 0.7 mm. latis gibboso-obtusis, dorso superne obtuse-carinatis, utrinque glabris, marginibus pectinato-ciliatis. Petala longe unguiculata, spatulata, 5 mm. longa, ungue albo-piloso, lamina oblongiuscula, 1.5 mm. longa, glabra. Stamina 5 mm. longa, filamentis parcissime strigillosis, staminodia petala simulantia eorumque unguibus adnata, sed limbis angustioribus et brevioribus, pilosis. Pistillum superne perbreviter et minute strigillosum; stylus crasse filiformis, glaber.

Cape Province: South-Western Region; Riversdale Div., Bo' plaats near Albertinia, Nov., 1913, *Dr John Muir*, 1255! (in Herb. Bolus and Albany Museum).

One of the members of the section *Pseudostemon*, with the aspect of a Lycopod, notably *L. saururus*, Linn., or of very coarse forms of *Agathosma imbricata*. It is distinct from any of the members of the section in which it is placed being characterised by its very coarse habit, subimbricate spreading, thick, apically incurved, broadly ovate leaves, with prominent dorsal gibbous midribs, and marginal and dorsal denticulations, the latter of a very peculiar nature.

A. krakadouwensis, *A. capituliformi*, var. *caledonensi* affinis, sed distinguitur ramulis pilosis, foliis subteretibus, vix carinatis, marginibus eciliatis, pedicellis pilosis, ceterisque.

Fruticulus gracilis, parcissime ramosus, pauciflorus, ad 0.7 m. altus,

ramis fastigiatis, superne verticillatim ramosis; ramuli angulati, citrini, pilosuli. Folia petiolata, ascendentia, subimbricata, interdum falcata, lanceolata, fere teretia, apice obtusiuscula, 4—5 mm. longa, 0·5 mm. lata, pallide viridia, tenuiter coriacea vel carnosula, primo albo-pilosula, mox glabrescentia, supra paulullo sulcata, dorso convexa, ruguloso-glandulosa, margine integra, eciliata. Inflorescentia capituliformis, sessilis, hemisphaerica, 7—10 mm. diam., floribus albidis (in sicco), confertis, bracteis folia simulantibus; pedicelli 1 mm. longi, pilosuli, superne bibracteolati, bracteolis filiformibus, pilosulis, 1·7 mm. longis. Calyx 1·7—2 mm. longus, utrinque parvissime pilosulus, segmentis oblongiusculis, obtusis, glandulosis, dorso obtuse carinatis, glanduliferis, subscariosis, marginibus albo-pilosis. Petala graciliter unguiculata, filiformi-spatulata, circ. 4 mm. longa, limbis obovato-cuneatis, dorso 1—3-glandulosis, unguibus inferne parce pilosis. Stamina glabra; staminodia filiformia vel oblanceolato-filiformia, 3·5—4 mm. longa, inferne parce pilosa. Stylus filiformis, circ. 5 mm. longus, parce patenter pilosus.

Cape Province: South-Western Region. Clanwilliam Div., on the Cedarbergen, Krakadouw Pass, 3000 ft., Oct., 1897, *H. Bolus*, 8959!

One of the section *Diplopetalum* with the facies of *A. capituliformis* v. *caledonensis*, mihi, or not unlike a slender growth form of *A. humilis* v. *capitata*, mihi (sect. *Pseudostemon*). Its alliance lies with the former variety, from which it is distinguished by its pilose twigs, the subterete pilose leaves, scarcely keeled dorsally, their non-ciliate margins, the pilose pedicels, the bracteoles which are almost at the base of the calyces, the smaller calyces, with pilose segments, the more slender petals and staminodes, and the patently pilose style.

- A. *tulbaghensis*, *A. montanae* accedit, sed foliis acicularioribus, dorso satis convexis, glandulis magis conspicuis praeditis, pedicellis floribusque glabris, distinguitur.

Fruticulus saepe dichotomo-ramosus, ad 0·7 m. altus, ramulis florentibus ascendentibus, brevibus, dense foliatis, obscure verrucoso-glandulosis, parce pilosis. Folia ascendentia, subimbricata, interdum subfalcata, conduplicata, acicularia, acuta, 8—10 mm. longa, 0·7—1 mm. lata, coriacea, ochraceo-viridia, utrinque glabra, supra profunde canaliculata, dorso convexiuscula, verruculoso-glandulosa, margine primo creberrime et longe pectinato-ciliata, mox glabrescentia. Umbella 5—12-flora, 1—1·3 cm. diam., foliis vix superans, floribus carneis, pedicellis 5—7 mm. longis, glabris, inferne bibracteolatis, bracteolis 0·5—0·7 mm. longis, minute ciliolatis. Calyx circ. 2 mm. longus, utrinque glaber, segmentis obtuse deltoideis, dorso convexiusculis, obscure punctato-glandulosis, margine eciliolatis. Petala obovato-cuneata, 3 mm. longa,

0.7—1 mm. lata, ubique glabra. Stamina glabra; staminodia petala simulantia sed paullo breviora glabraque. Ovarium cum stylo glabrum.

Cape Province: South-Western Region. Tulbagh Div., near summit of the Great Winterhoek, Nov. 1916, *Dr E. P. Phillips*, 1718! (in Herb. S.A. Mus. 11176). Stony places, Little Winterhoek, 1100 m. Dec. 1884, *Dr R. Marloth*, 493! (in Herb. Marloth).

At first sight this plant would appear to fall in the acicular-leaved group of the section *Euagathosmae* near *A. prolifera* or *A. adenocaulis*, but the petaloid staminodes suggest its inclusion in *Diplopetalum* near *A. montana*, Schlechtendahl, from which it is separated by the obscure glands which subtend the leaves, by its more acicular leaves more or less convex dorsally, with more prominent worted glands, and more closely comb-like marginal ciliation, and by the essentially glabrous pedicels and flowers.

Of *A. montana*, Schl., the S.A. Museum is only in possession of a small flowering twig about 8 cm. long.

A. decora, ab omnibus ceteris sectionis *Diplopetalum* distinguitur glandulis subtendentibus, foliis complanatis, brevibus ovatis, margine glandulis valde conspicuis praeditis.

Frutex gracilis, ad 1 m. altus, inferne nudus, superne dense verticillato-ramosus, ramulis fastigiatis, saepe simplicibus, brunneis, verrucoso-glandulosis, minute puberulis, foliis obtectis. Folia petiolata, ascendencia, subimbricata, interdum amplexicaulia, complanata, ovata vel late elliptica, obtusa vel obtusiuscula, 2.5—3 mm. longa, 1.7—2 mm. lata, coriacea, supra complanata vel subconcavia, nitida, supra rugulosa, ecostata, margine valde 3—5 punctato-glandulosa, inferne minute pectinato-ciliolata. Umbellae numerosae, confertiflorae, capitatae, hemisphaericae, roseae, circiter 1 cm. diam.; pedicelli glabri, circiter 1 mm. longi; bracteolae basilares, binae, 2.5 mm. longae, pectinato-ciliatae. Calyx 1.5 mm. longus, utrinque glaber, segmentis oblongo-triangularibus, dorso apice obtuse glandulosis, margine ciliolatis. Petala unguiculata, 3.5 mm. longa, glabra, limbis late obovatis. Stamina 4—5 mm. longa, glabra, antheris atrobrunneis; staminodia anguste cuneata vel oblanceolata, 3 mm. longa, glabra, apice glandula notata. Stylus filiformis, 4 mm. longus, patenter pubescens.

Cape Province: South-Western Region; Ceres Div., Matroosberg near Laaken Vlei, 5500 ft., Nov., 1917, *Dr E. P. Phillips*, 1965! (in Herb. S.A. Museum, 11765).

Var. *Buchu*.

Umbellae 5—7 mm. diam., albae. Petala 2.5 mm. longa. Stylus **mox glabra**.

Matroosberg; near Laaken Vlei, 5500 ft., Nov., 1917, *Dr E. P. Phillips*, 1966! (in Herb. S.A. Museum, 11766).

Var. *pseudohybrida*.

Frutex humilior, ad 0.3 m. altus. Folia imbricata, late ovata vel latissime elliptica, obtusa, 3.5—4 mm. longa, 2.5—3 mm. lata, margine superne sparse glanduloso-crenulata. Capitula 5—8 mm. diam. Flores rosei; pedicelli vix 1 mm.; bracteolae filiformes, ciliatae, circiter 2 mm. longae. Petala 4 mm. longa. Stamina anguste spatulata, 3 mm. longa, glabra. Stylus filiformis, 5—7 mm. longus, inferne patenter pubescens.

Matroosberg, 6500 ft., Jan., 1897, *A. Bolus* (Herb. Guthrie, No. 4395!) (in Herb. Bolus).

The two or three large glands which subtend the individual leaves suggest this plant's alliance to *A. adenocaulis*, E. and Z., but the capitate inflorescences and petaloid staminodes place it in section *Diplopetalum* from whose members it is at once distinguished by its subtending glands, flattened and short ovate leaves and large marginal leaf-glands.

Both type and var. *Buchu* are robust plants, and the leaves when rubbed especially in the variety *Buchu* exhale a strong *Buchu*-like odour. Variety *pseudohybrida* is a much more dwarf plant, with more imbricate and larger leaves and with the facies of *A. imbricata* forms. I suspect it to be a natural hybrid between *A. alpina*, Schlechter, and *A. decora*, both of which grow together on the Matroosberg at approximately the same elevation. Dr E. P. Phillips, who examined the variety *Buchu*, in a MS. note mentions that the lower flowers in the inflorescences are perfect, whereas the upper are only male.

A. Sonderiana, *A. Burchellii* proxime accedit, sed distinguitur foliis glabris, pro ratione brevioribus latioribusque, rarius in tria dispositis, apice subacutis, pedicellis brevioribus, sepalis petalisque eglandulosis, his apice haud penicillio praeditis.

Fruticulus gracilis, dense divaricato-ramosus, partibus junioribus ubique puberulis, ramulis ultimis griseo-brunneis, gracilibus, dense foliatis. Folia ascendentia vel patula, breviter petiolata, anguste elliptica, subacuta, 4—6 mm. longa, 1—2 mm. lata, coriacea rigidaque, utrinque puberula et eglandulosa, subtus costata, pallide viridia, margine saepe valde revoluta (sicco), incrassata, punctato-glandulosa. Flores rosei (sicco) axillares, interdum solitarii vel in umbellas terminales, 2—5-floras, dispositi, pedicellis ad 3.5 mm. longis, patenter puberulis, basi bracteolatis. Calyx parvulus, 1—1.5 mm. altus, minute puberulus, lobis anguste obovatis, dorso superne obtuse carinatis. Petala sessilia, obovato-elliptica, rotundata obtusave, ad 3 mm. longa, 1 mm. lata, glabra. Stamina 2—3 mm. longa, glaberrima. Stamina anguste

elliptica, 1 mm. vix excedentia, parcissime pubescentia, vix capitato-glandulosa. Stylus cum ovario glaber, filiformis, ad 4 mm. longus.

Cape Province: South-Western Region; Mossel Bay Div., Montagu Pass, 3500 ft., Nov. 1894, *Schlechter*, 5812! (in Herb. Bolus and Albany Museum). A specimen in the Gill College Herbarium received Oct., 1904, from A. Kennedy in the neighbourhood of Humansdorp.

Apparently closely allied to *A. Burchellii*, mihi, but distinguished by the relatively shorter, broader, and glabrous leaves rarely disposed in threes, their subacute apices, shorter pedicels, eglandular sepals and petals, which latter have moreover not the tiny tuft of hairs at their apices. Like *A. Burchellii* it has the facies of *Barosma microcarpa*.

A. Marlothii, *A. planifoliae*, ut videtur, accedit, sed foliis ellipticis vel late lanceolatis, puberulis, pedicellis calycibusque glabris longioribusque, petalis brevioribus, ceterisque distinguitur.

Fruticulus erectus, vel paullo decumbens, ad 17 cm. altus, laxe ramosus, ramulis gracilibus puberulis. Folia patentia, vix ascendentia, complanata, elliptica vel late lanceolata, obtusa vel subacuta, basi cuneata vel cuneato-rotundata, petiolo ad 0.5 mm. longo, brunneo, planiusculo, suffulta, 5—8 mm. longa, 1.5—2.5 mm. lata, coriacea, utrinque minute griseo-puberula, olivaceo-viridescencia, subtus punctato-glandulosa, ecostata, margine incrassata, valde punctato-glandulosa, minute ciliolata. Umbella hemisphaerica, laxe 5—multiflora, ad 2 cm. diam., floribus purpureis (*teste* A. Bolus), pedicellis gracilibus, ad 1 cm. longis, nudis, glabris. Calyx circiter 3 mm. altus, glaber, segmentis mox reflexis, late oblongis, extus valde punctato-glandulosis, apice obtusa vel rotundata. Petala breviter unguiculata, 3—3.5 mm. longa, 1.2—1.5 mm. lata, utrinque glabra, lamina late ovata vel ovato-elliptica vel elliptica, apice obtusa vel rotundata. Stamina 4—5 mm. longa; glabra. Staminodia parvula, elliptica, 1.5 mm. longa, medio parce pilosa, glanduloso-capitata. Stylus crasse filiformis, ad 3 mm. longus, cum ovario glaberrimus.

Cape Province: South-Western Region; Tulbagh Div., Great Winterhoekberg, Dec., 1896, *A. Bolus* in Herb. Bolus, 4187!

Related to *A. planifolia*, Sond., apparently (which latter has not been rediscovered since the time of Niven, and of which dried material is only in the Herbaria of Martius and Sonder), from which it differs in its elliptic or broadly lanceolate relatively longer but narrower puberulous leaves, glabrous and longer pedicels and calyces, the latter punctate-glandular, shorter petals (the petals are not much longer than the calyces), and other floral characters.

Specimens of this species are also in Dr Marloth's Herbarium, collected by him on Matroosberg at 6000 ft., Dec., 1895, Herb. No. 2223.

These were provisionally named by Schlechter as *Barosma Marlothii*, cf. Marloth, *Das Kapland*, Wiss. Ergeb. Deutsch. Tief. Exp. II, III (1908), 175.

- A. Keetii, *A. Marlothii* accedit, sed facie glauciore, foliis minoribus, ovatis vel late ovatis, marginibus haud impresso-glandulosis, pedicellis calycibusque multo brevioribus puberulisque, ceterisque differt.

Fruticulus gracilis, superne verticillato-ramosus, ad 0.3 m. altus, ramulis florentibus gracilibus, dense griseo-pubescentibus, foliatis ad 10 cm. longis. Folia ascendentia vix subimbricata, mox patula, breviter petiolata, ovata vel late ovata, obtusa, 2—4 mm. longa, 1.5—2 mm. lata, coriacea, complanata, griseo-viridia, paullulo glaucescentia, subtus pallidiora, supra glabra, subtus parce griseo-pubescentia, mox glabrescentia, obscure punctato-glandulosa costataque, margine paullo incrassata, haud punctato-glandulosa, primo basin versus parce ciliolata, mox integra. Umbellae 3—7-florae, ad 1.5 cm. diam., floribus carneis (sicco); pedicelli 3 mm. longi, patenter puberuli. Calyx extra puberulus, circiter 2 mm. longus, lobis crassiusculis, oblongis, obtusis, dorso obtuse carinatis, marginibus ciliatis. Petala sessilia, obovata vel obovato-elliptica, obtusa vel rotundata, 4 mm. longa, 1.7—2 mm. lata, supra e basi margineque parcissime puberula. Stamina 3.5—4 mm. longa, glaberrima. Staminodia circiter 0.7—1 mm. longa, oblonga, parce pubescens, apice rotundata. Stylus filiformis, 3—4 mm. longus, cum ovario, glaber.

Cape Province: South-Western Region; Knysna Div., Plaats Bosch, Jan., 1917, *J. D. Keel*; Forestry Depart. Herb., 2386! (in Herb. Bolus).

Related to and with the habit of *A. Marlothii*, mihi, but with a more glaucescent or greyish aspect, smaller differently shaped leaves glabrescent above at maturity, and with their margins not impresso-glandular, much shorter and puberulous pedicels and calyces (the latter with marginal ciliation), and relatively longer petals.

- A. perplexa, *A. craspedotae* et *A. fraudulentae* accedit, sed ab illa petalis staminodiisque minutis, ab hac habitu, foliis ellipticis eglandulosis, pedicellis glabris, staminodiis minoribus, petalis eglandulosis differt.

Fruticulus decumbens, dense foliatus, ramis magis minusve simplicibus, ad 15 cm. longis, minute puberulis. Folia ascendentia, vel subpatula, breviter petiolata, complanata, elliptica vel late-elliptica, subacuta vel obtusa, 5—8 mm. longa, 2.5—3.5 mm. lata, coriacea, utrinque puberula et ochraceo-viridia, subtus obscure costata, epunctata, margine paullulo incrassata, magis minusve glanduloso-crenulata, ciliolata. Umbellae 4—5-florae, floribus roseis (sicco); pedicelli citrini, glabri, 5—7 mm. longi. Calyx 2.5—3 mm. longus, glaber, obscure

verrucoso-glandulosus, lobis concavis, late deltoideis vel fere orbicularibus, obtusis vel rotundatis. Petala parvula, perbreviter unguiculata, 2—2.5 mm. longa, lamina ovale vel oblonga, rotundata, glabra, eglandulosa. Stamina glabra. Staminodia elliptica, 1 mm. vix excedens, apice glandula brunnea notata, margine pectinato-ciliolata. Pistillum glabrum.

Cape Province: South-Western Region; Ceres Div., Koude Bokkeveld; Skurfdebergen, Wagebooms Rivier, 6000 ft., Jan., 1897, *Schlechter*, 10163! (in Herb. Bolus).

This species superficially resembles decumbent forms of *A. craspedota*, but its minute petals and staminodes distinguish it immediately from that plant. It has been distributed as *Barosma foetidissima*, B. and W., but its umbellate inflorescences and alternate leaves (if the latter is a tenable character?) assign it to *Agathosma*.

Besides Sonder's description of *B. foetidissima* (Fl. Cap. I, 398 (1860)) does not tally with this plant. Specimens of the former do not appear to be in any of the S.A. Herbaria. The plant also approximates to *A. fraudulentum*, Sond., in its petals subequalling the calyx, but its habit, the eglandular elliptic leaves, glabrous pedicels, smaller staminodes, and eglandular petals separate it.

A. Pillansiana, *A. piliferae* accedit, sed foliis margine revolutis, sine mucrone capillaceo, umbellis floribus paucioribus praeditis, pedicellis multo brevioribus, petalis longioribus differt.

Frutex gracilis, 0.5 m. altus, parce ramosus, ramis strictis vel ascendentibus, cinerascens-brunneis, parce et laxe foliatis vel saepe nudis; ramulis florentibus saepissime verticillatim dispositis, 3—6 cm. longis, laxe foliatis, puberulis. Folia ascendentia vel patentia, petiolata, elliptica vel ovato-elliptica, acuta vel subacuta, basi subrotundata, 4—7 mm. longa, 1.5—2 mm. lata, crasse coriacea rigidaque, utrinque glabra, supra planiuscula, ochraceo-viridia, subtus incrassato-costata, margine incrassato, paullo recurva, creberrime glanduloso-punctata. Umbella pauciflora (3—6-fl.), 1—1.5 cm. diam., floribus carneis (sicco), pedicellis 3—4 mm. longis, parce puberulis. Calyx 2 mm. longus, lobis obtuse deltoideis, dorso incrassato-carinatis, extus parce puberulis, margine ciliolatis. Petala sessilia, obovato-cuneata, 4 mm. longa, supra parce puberula. Stamina petalis subaequilonga, glabra. Staminodia parvula, anguste elliptica, 1.5 mm. longa, parce pilosa. Pistillum glabrum, stylo filiformi, ad 5 mm. longo.

Cape Province: South-Western Region; Riversdale and Oudtshoorn Div., Herb. Bolus, No. 13759! Herb. S.A. Museum, No. 7554!

The ample material (two sheets) upon which this diagnosis is based was received from the Cape Town Wild-Flower Show in October, 1914,

from specimens from the Riversdale and Oudtshoorn Divisions; the precise locality remains unknown. It is a very floriferous though sparsely leafy plant, and shows an alliance to *A. pilifera*, Schlechtendahl, but the revolute-margined leaves, devoid of the hair-like mucro, fewer-flowered umbels, much shorter pedicels, and longer petals afford characters for discrimination. The species is named in compliment to Mr N. S. Pillans, attached to the staff of the Bolus Herbarium.

A. craspedota, E. Mey. var. *eglandulosa*.

Fruticulus laxe ramosus, ramis minutissime puberulis. Folia interdum dorso eglandulosa. Pedicelli glaberrimi, eglandulosi.

This variety is based upon two specimens in Dr Marloth's collection (7792) (without information as to locality or date of collection) and deviates from the type in the laxer habit, more minutely puberulous twigs, in the leaves being often epunctate dorsally, and in the glandless pedicels.

A. Pattisonae, *A. fraudulentae* valde affinis, sed foliis eglandulosis, marginibus haud incrassatis, floribus solitariis vel paucis in umbella, petalis multo longioribus, carpellis glabris differt.

Fruticulus nanus, parce vel divaricato-ramosus, ad 10 cm. altus, decumbens, ramulis florentibus brevissimis, citrino-brunneis, pubescentibus, dense foliatis. Folia majuscula, plana, breviter petiolata, magis minusve patula, obovata vel obovato-elliptica, subacuta vel rotundato-cuspidata, 5—7 mm. longa, circiter 3 mm. lata, coriacea, utrinque pallide viridia et parce albo-pubescentia, eglandulosa, supra costata reticulataque, margine haud incrassata vel punctato-glandulosa, pectinato-ciliolata. Umbellae pauciflorae (1—5-florae), floribus albidis (sicco); pedicelli graciles, 7—15 mm. longi, citrini, parce patenter albo-pubescentes. Calyx parvulus, 3 mm. longus, albo-pubescent, lobis crassiusculis, anguste deltoideis, obtusis, dorso vix carinatis. Petala sessilia, oblongiuscula vel oblongo-cuneata, apice rotundata, 8—9 mm. longa, circiter 3 mm. lata, dorso glandulis majusculis, atrobrunneis (8—10) ornata, margine parcissime pilosula. Stamina 12 mm. longa, filamentis inferne parce pubescentibus. Staminodia late lanceolata, 5—6 mm. longa, apice glandula atrobrunnea notata, margine parce pilosa. Pistillum glabrum, stylo (immature?) crassiusculo, 2 mm. longo.

Cape Province: South-Western Region; Clanwilliam Div., Cedarbergen, Dec., 1913, *Mrs R. Pattison* (Herb. Bolus, No. 13733!).

Obviously allied to *A. fraudulentae*, Sonder (of which the exact locality is unknown and of which dried specimens obtain only in the Sonder Herbarium), but distinguishable by its dwarfer and more stunted habit, eglandular leaves and not thickened margins, solitary flowers or few-flowered umbels, eglandular calyx-lobes, much longer

petals, which like *A. fraudulenta* are however gland-dotted, large staminodes, and glabrous carpels. It has also the habit of a *Barosma*, and the leaves the pleasant smell of "Buchu," but my interpretation of the two groups leads me to assign it to *Agathosma*. This plant may prove to be of pharmaceutical value, and hence its occurrence is brought to the notice of pharmacologists and those interested in the exploitation of the Buchu industry.

A. utilis, *A. craspedotae* affinis, sed foliis puberulis, lobis calycis saepissime reflexis, ciliolatis, petalis majoribus albisque, staminodiis brevioribus, ceterisque differt.

Frutex parce ramosus, 0.5 mm. altus, facie *A. denticulatae*, mihi similis, ramis inferne nudis, cinereo-griseis, superne brunneis, foliatis, puberulis. Folia ascendentia, magis minusve adpressa, subimbricata, petiolata, ovata vel ovato-elliptica vel late elliptica, obtusa vel subacuta, 5—8 mm. longa, ad 3 mm. lata, crasse coriacea, utrinque minute puberula, vix costata, dorso punctato-glandulosa, flavescenti-viridia, margine incrassata, punctato-glandulosa, ciliolata, superne irregulariter denticulata; petiolo complanato, circiter 1 mm. longo. Umbella majuscula 2—8-flora, ad 2 cm. diam., floribus albidis (sicco); pedicelli 5—7 mm. longi, stipitato-glandulosi. Calyx 3.5 mm. longus, extus parce stipitato-glandulosus, segmentis late oblongis (2 mm.) denticulato-truncatis, dorso obtuse scarioso-carinatis, marginibus hyalinis. Petala sessilia, obovato-cuneata, 5—6 mm. longa, 2—3 mm. lata, inferne parcissime puberula ciliolataque. Stamina petalis subaequilonga, filamentis basin versus parcissime pilosis; staminodia oblonga, 2 mm. longa, circiter 1 mm. lata, parce pilosa, apice glandula magna citrina instructa. Pistillum glabrum, stylo filiformi, 4—5 mm. longo. Carpella matura verrucoso-glandulosa, cornubus incurvatis, circiter 2 mm. longis.

Cape Province: South-Western Region; Clanwilliam Div., Cedarbergen, Dec., 1913, *Mrs R. Pattison* (Herb. Bolus, No. 13734!).

Allied to *A. craspedota*, E. Meyer, and with its facies and leaves, but differing in the puberulous leaves, differently shaped usually reflexed calyx lobes with no ciliolation, larger and white petals, shorter staminodes which are moreover tipped by a citron-coloured and not black gland. *Mrs R. Pattison* states that from the leaves "a kind of tea" is brewed.

A. mucronulata, Sond. var. *Rudolphii*.

Fruticulus parvulus, dichotomo-ramosus, ramis fastigiatis superne foliatis, castaneis, minute puberulis. Folia ascendentia, subimbricata, apice recurva, late elliptica, rigide et acute apiculata; lamina 4 mm. longa, 2.5—3 mm. lata, valde coriacea, utrinque glabra, supra brunneo-viridia, nitida, subtus pallidiora, valde punctato-glandulosa, vix

costata, margine haud incrassata, eglandulosa; petiolo complanato, citrino, ad 0·7 mm. longo, glabro. Umbella pauciflora (2—5-fl.), circiter 1 cm. diam., floribus carneis (sicco); pedicelli 3—3·5 mm. longi, puberuli. Calyx 4—4·5 mm. longus, tubo parcellissime puberulo, lobis glabris, obovato-oblongis, setaceo-cuspidatis, dorso obtuse scarioso-carinatis, glandulis verrucosis notatis, marginibus glabris. Petala obovato-elliptica, obtusa vel rotundata, 5 mm. longa, 2—2·5 mm. lata, inferne parcellissime puberula, mox glabrescentia. Stamina glabra. Staminodia crassa, anguste oblonga, circiter 2 mm. longa, ciliolata, apice glandula deltoidea notata. Pistillum glabrum, stylo crasse filiformi, ad 3 mm. longo.

Cape Province: South-Western Region; Willowmore Div., on the mountains near Swanepoelspoort, 4000 ft., Sept., 1905, *Marloth*, 4128! (in Herb. *Marloth* and *Bolus*).

Differs from typical *A. mucronulata*, *Sonder*, which also emanates from the same locality. From it, the more erect habit, essentially glabrous leaves, puberulous calyces (not velvety), longer calyx-lobes, longer petals, and glabrous ovary afford salient characters of distinction.

Burchell's specimens (No. 4999) Kew Herb. from a rocky hill near Haarlem and Avontuur (Uniondale Div.), March 14th, 1814, may belong here. Cf. *Fedde*, *Repertorium*, XI (1912), 403, under *A. mucronulata*, *Sond.* What I take to be good *A. mucronulata*, *Sonder* (*A. mucronata* in *Sonder's* key to the species of this group), is a specimen in the Albany Museum collected by Mrs T. V. Paterson in Nov., 1912 (3065), near Uniondale—the only dried specimen I am aware of in S.A. collections.

A. Tugwelliae, *A. sessilipetalae* affinis, sed foliis ellipticis glaberrimis, marginibus glanduloso-notatis, capitulis minoribus, pedicellis longioribus, calyce multo minore, lobis eglandulosis, petalis minoribus angustioribusque differt.

Fruticulus gracilis, multiramosus, circiter 0·3 m. altus, ramis fastigiatis, griseo-puberulis, foliatis. Folia ascendentia, vix imbricata, late elliptica vel ovato-elliptica, subacuta, inferne in petiolum per brevem sensim attenuata, 4—7 mm. longa, 2—2·5 mm. lata, valde coriacea, glaberrima, nitidula, supra olivaceo-atroviridia, subtus pallidiora, parce punctato-glandulosa, costata, margine incrassata, punctato-glandulosa. Umbella pauciflora (2—5-flora), 0·7 cm. diametro, floribus roseis (sicco); pedicellis 4—5 mm. longis, puberulis. Calyx 6·5—6·7 mm. longus, segmentis deltoideis obtusis, dorso minute puberulis, obtuse carinatis, marginibus ciliolatis. Petala elliptico-oblonga, obtusa vel rotundata, 3—3·5 mm. longa, 1·5 mm. lata, e basi parcellissime puberula. Stamina glabra. Staminodia elliptica,

1—1.5 mm. longa, apice glandula acuta notata, margine parce pubescentia. Pistillum glabrum, stylo filiformi, 3 mm. longo.

Cape Province: South-Western Region; Prince Albert Div., Prince Albert, June, 1908, *A. M. Krige* (Herb. Bolus, No. 13432!).

This species has the aspect of some of the smaller leaved *Adenandras* and dries a fresher green than the majority of the section *Barosmaepetalae*. Its nearest ally appears to be *A. sessilipetala*, mihi, but it is distinguished from it by its more dwarf habit, elliptic wholly glabrous almost shining leaves, their gland-dotted margins, smaller flower heads, longer pedicels, much smaller calyx, eglandular calyxlobes and smaller and narrower petals.

Named after the collector, now Mrs Tugwell.

- A. *Phillipsii*, ab omnibus sectionis *Barosmaepetalae* differt habitu nano caespitoso, foliis fere succulentis, floribus pilosis.

Fruticulus parvulus, prostratus vel decumbens, 9 cm. diametro, dense foliatus, ramis abbreviatis, cinerascens, glabris; ramuli florescentes perbreves, brunnei vel rubescentes, albo-pubescentes. Folia perbrevis petiolata, ascendens vel subpatens, elliptica vel obovato-elliptica, apice obtusa vel subrotundata, basi attenuata, cum petiolo 3—4 mm. longa, 1.5—1.7 mm. lata, carnosula, ochraceo-viridia, supra sulcato-concava, subtus convexa, obscure punctato-glandulosa, ubique patenter pubescens, margine ciliata. Umbellae ramulos perbreves foliatis terminantes, 1—3-fl., floribus majusculis, albo-roseis, pedicellis 2—4 mm. longis, rubescentibus, patenter-pubescentibus, bracteolatis. Calyx ubique patenter-pubescentis, lobis erectiusculis, oblongis, concavis, obtusis, 2—2.5 mm. longis. Petala sessilia, oblonga vel oblanceolato-oblonga, rotundata, 3—3.5 mm. longa, 1—1.5 mm. lata, ubique parce pilosa. Stamina 4 mm. longa, filamentis inferne parce pilosis, antheris citrinis. Staminodia anguste-elliptica, minuta, circiter 1 mm. longa, glanduloso-terminata, medio pilosa. Stylus crasse filiformis, 2.5—3 mm. longus, cum ovario patenter pubescens.

Cape Province: South-Western Region; Ceres Div., growing in holes in the face of weathered rocks; Matroosberg near Laaken Vlei, 4500 ft., Dec., 1917, *E. P. Phillips*, 1962! (in Herb. S.A. Museum, 11762).

Essentially an alpine type and differing from all the members of the section *Barosmaepetalae* by its dwarfed, stunted and cushion-shaped habit, almost succulent leaves, and pilose flowers. Named after the collector, Dr E. P. Phillips, whose name is intimately associated with botanical work in South Africa.

- A. *riversdalensis*, *A. Muirii* affinis, sed foliis ascendens, ovatis, glabris, dorso epunctatis, pedicellis eglandulosis glabris, ceterisque differt.

Fruticulus gracilis, multiramosus, inferne nudus, griseus, superne foliosus; ramuli ultimi imbricato-foliosi, breves, patenter pubescentes. Folia ascendentia, apice paullulo incurva, ovata, fere cordata, obtusiuscula, circ. 2 mm. longa, 1.5—1.7 mm. lata, coriacea, utrinque glabra, subtus fere epunctata et ecostata, apicem versus paullulo obtuse gibbosa, margine haud incrassata, integra, eciliolata. Umbella capitata, 5—10 mm. diam., floribus pallide carneis (siccis), pedicellis glabris, 1.5 mm. longis; bracteolis minutissimae, ciliolatis, medio positae. Calyx circiter 1 mm. longus, utrinque glaber, segmentis ovatis, apice rotundatis, dorso obtuse carinatis, marginibus pectinato-ciliolatis. Petala breviter unguiculata, obovato-oblongiuscula, 2.5—3 mm. longa, 1 mm. lata, unguibus parcissime pilosulis. Stamina glabra. Staminodia filiformia, circ. 2 mm. longa, medio valde inflata et pilosula, apice stipitato-glandulosa. Ovarium cum stylo glabrum.

Cape Province: South-Western Region; Riversdale Div., near Zoutpan, Sept., 1913, *Dr J. Muir*, 1103! (in Herb. Bolus). Melkhoutfontein on the Gauritz River, July, 1913, *Dr J. Muir*, 1111! (in Herb. Bolus).

Nearest to *A. Muirii*, Phillips (which should be transferred to the section *Barosmaepetalae* by rights), but differing in the ascending (not spreading or reflexed) more crowded, glabrous ovate leaves, epunctate dorsally, the slight dorsal callosity at the apex, eglandular glabrous pedicels, and floral characters. *Dr Muir's* No. 928 from Oude Tuin, Albertinia, collected in June, 1913, and in the S.A. Museum Herb. (4999) appears to be a transition stage between this species and *A. Muirii*, Phillips.

- A. *formosissima*, *A. adenandriiflorae* accedit, sed habitu robustiore, foliis majoribus, pedicellis villosis, segmentis calycis sine glandulis stipitatis, floribus multo majoribus differt.

Fruticulus 0.3 m. altus, inferne nudus, superne verticillato-ramosus, foliatus. Rami nigro-brunnei, glabrescentes; ramuli florati foliosi, breves, patenter puberuli, visciduli, rubidi. Folia majuscula, patula, petiolata, late elliptica, basi paullulo rotundata, apice recurvo-subcuta, circiter 1 cm. longa, 4—5 mm. lata, crasse coriacea, paullulo viscidula, complanata, supra atro-viridia, nitidula, subtus pallidiora, costata, obscure 5—10-glanduloso-punctata, utrinque minute puberula, margine recurva, vix incrassata, obscure punctato-glandulosa; petioli complanati, ad 1 mm. longi. Umbellae ramulos perbreves, foliatos, terminantes, 4—8-florae, floribus magnis, albo-roseis; pedicelli circiter 1 cm. longi, albo-pilosi, brunnei; bracteolae basiales (2—3), late obovato-oblongae, scariosae, circiter 3 mm. longae, obtuse deltoideae vel fere truncatae, dorso minute puberulae, valde costato-carinatae, margine

densissime ciliolata. Calyx 8—10 mm. longus, dorso lilacino-roseus, breviter albo-pilosus, segmentis oblongo-lanceolatis, obtuse acuminatis, complanatis, dorso obscure glanduloso-punctatis, marginibus albo-pilosis. Petala vix unguiculata, late oblanceolata, obtusa, 12—15 mm. longa, 2·5—3 mm. lata, utrinque parce pubescentia, margine paullulo pilosa. Stamina circiter 1 cm. longa, glabra. Staminodia filiformi-oblonga, apice truncato-glandulosa, crassiuscula, 7 mm. longa, 0·7 mm. lata, paullulo pilosula. Stylus filiformis, 10—12 mm. longus, glaber.

Cape Province: South-Western Region; Ceres Div., October, 1916 (Herb. Bolus, No. 15849!).

The largest-flowered of all the *Agathosmas*, and more like an *Adenandra* superficially. It is allied to *A. adenandriiflora*, Schlechter, but differs in its more robust habit, larger leaves, villous pedicels, calyx-segments without stipitate glands, and much larger flowers. The specimens were secured at the Cape Town Wild-Flower Show, held in October, 1916.

- A. *cedrimontana*, *A. squamosae* affinis, sed habitu robustiore, foliis minus adpressis, pro ratione longioribus angustioribusque, capitulis majoribus, floribus pedicellatis, carpellis immaturis leviter barbatis differt.

Fruticulus 0·5 m. altus, habitu *A. squamosae*, B. et W., inferne nudus, griseus, superne multo dichotomo-ramosus, ramulis confertis, rectis, pallide brunneis, glabris, foliosis. Folia fere adpressa, subimbricata, perbreviter petiolata vel subsessilia, ovalia, obtusa, 2—2·5 mm. longa, 1—1·3 mm. lata, subcoriacea, utrinque glabra, supra concava, subtus convexa, obscure verruculoso-glandulosa, margine dense pectinato-albo-ciliolata, mox fere glabra. Umbellae numerosae, capitatae, 5—15-fl. (raro 1-fl.), 5—10 mm. diam., floribus albis; pedicelli breves, 1—1·5 mm. longi, glabri, medio bracteolati; bracteolae 1 mm. vix excedentes, ciliolatae. Calyx 1·5—1·7 mm. longus, utrinque glaber, segmentis triangularibus, obtusis, extra obtuse carinatis, marginibus pectinato-ciliolatis. Petala unguiculata, 4·5 mm. longa, glabra, lamina anguste obovata, vix 1 mm. lata. Stamina 5 mm. longa, glabra; staminodia lanceolata, minute glanduloso-capitata, medio pectinato-pilosula. Pistillum superne barbatulum, stylo filiformi glabro.

Cape Province: South-Western Region; Clanwilliam Div., Cedarbergen, Dec. 1913, *Mrs R. Pattison* (Herb. Bolus, No. 15832!).

Closely allied to *A. squamosa*, B. and W., of the section *Imbricatae*, from which its more robust habit, less adpressed relatively larger and narrower leaves, larger flower-heads, pedicellate flowers, longer petals and slightly bearded immature carpels, separate it.

- A. *Bodkinii*, ab omnibus sectionis *Imbricatae* habitu alpino, foliis utrinque minute pubescentibus, marginibus haud pectinato-ciliatis, floribus minimis, stylo pubescente differt.

Fruticulus pusillus, 6 cm. altus, e basi ramosus, caulibus numerosis, dense confertis, subdecumbentibus, puberulis, imbricato-foliatis. Folia elliptica, circiter 3 mm. longa, 1.5—2 mm. lata, obtusa, coriacea, utrinque minute pubescentia, supra concava, nitidula, subtus convexiuscula, margine integra, obscure punctato-glandulosa. Umbella capitata, parvula, circiter 5 mm. diametro, multiflora, floribus minutis albidis (sicco), bracteis foliaceis, bracteolis basilaribus, binis, 0.7 mm. longis, pedicelli 1.5—2 mm. longi, superne minute puberuli. Calyx 1.5—1.7 mm. longus, extra puberulus, segmentis oblongiusculis, concavis, obtusis, dorso obtuse carinatis. Petala unguiculata, spatulata, circiter 2 mm. longa, 0.7 mm. lata, omnino glabra. Stamina 3.5 mm. longa, glaberrima. Staminodia filiformia, 1.7 mm. longa, glabra, apice distincte glandulosa. Pistillum patenter puberulum, stylo crasse filiformi, inferne patenter pubescenti.

Cape Province: South-Western Region; Clanwilliam Div., Sneeuwkop, 4500 ft, Cederbergen, near Wupperthal, October, 1897, *A. Bodkin* (Herb. Bolus, No. 8958!).

One of the section *Imbricatae*, distinguished from all by its dwarf alpine habit, minutely pubescent leaves (on both surfaces) not pectinate-ciliate margins, very small flowers, their correspondingly smaller parts, and pubescent style.

A. gracilipetala, *A. ciliatae* forsitan proxime accedit, sed distinguitur foliis multo minoribus, magis ovatis, fere cordatis, apice cuspidato-acuminatis, umbellis capitatis, minoribus, petalis gracillimis, ceterisque.

Fruticulus ad 0.5 m. altus, parce foliatus, superne verticillato-ramosus, paullulo divaricato-ramosus, ramulis citrinis, patenter pilosis. Folia patula, complanata, ovata vel late ovata, cuspidata vel acuminato-cuspidata, interdum basi subcordata, 4—5 mm. longa, 1.7—2.3 mm. lata, tenuiter coriacea, pallide ochraceo-viridia, supra glabra, subtus strigulosa, parcissime costato-ciliata, margine pectinato-ciliata. Umbella capitata, hemisphaerica, circiter 1 cm. diam., multiflora, floribus albidis (sicco), bracteis foliaceis, reflexis; pedicellis crassiusculis, 2—2.5 mm. longis, glabris, medio bracteolatis. Calyx 1.7—2 mm. longus, utrinque glaber, segmentis triangularibus, glanduloso-obtusis, dorso obtuse carinatis, margine paullulo pectinato-ciliatis. Petala longe unguiculata, 4 mm. longa, lamina obovato vel fere rotundata, parvula, circiter 1 mm. longa, glabra, unguibus inferne parcissime pilosis. Stamina ubique glabra. Staminodia longe spatulata, 2 mm. longa, unguibus patenter pilosis. Pistillum superne parce strigillosum, stylo crassiusculo, glabro.

Cape Province: South-Western Region; Caledon Div., hills near Caledon, 1000 ft., October, 1899, *H. Bolus*, 9152! (in Herb. Bolus, and Albany Mus.).

A species of the *Euagathosmae* group of Subsection A of Sonder, perhaps nearest to *A. ciliata*, Link, from which its more dwarf more divaricate habit, much smaller, more ovate, almost cordate, leaves (reflexed below the umbels) with cuspidate-acuminate tips, entire margins, epunctate dorsal surfaces, smaller capitate umbels, very slender petals, short staminodes in comparison with the calyx, separate it. Superficially it might be mistaken for a spreading leaved form of *A. imbricata*, v. *acuminata*.

A. bicolor, *A. capitatae* affinis, sed habitu, foliis longioribus, obtuse carinatis, parce pilosis, minute denticulatis, bracteolis basilaribus, petalis gracillimis, filiformibus, stylo infra medium patenter piloso differt.

Fruticulus decumbens, serpyllaceus, gracillimus, parce foliatus, ramis saepe 1·5 m. longis, ramulis atrobrunneis, paullulo pilosis. Folia patula, raro ascendentia, interdum falcata, lanceolata, subacuta, 5—10 mm. longa, 1·3—2 mm. lata, coriacea vel crasse coriacea, pallide viridia, supra sulcata vel concava, dorso carinata, utrinque sparse pilosula et minute denticulato-scaberula, margine minute denticulata. Umbellae capitatae, fere nudaе, confertiflorae, hemisphaericae, circiter 1 cm. diam., floribus albidis (sicco); pedicellis 0·7—1 mm. longis, glabrescentibus; bracteolis basilaribus, subulatis, 1 mm. longis, pilosis. Calyx 1·7 mm. longus, utrinque glaber, segmentis obtuse subulatis, dorso obtuse carinatis, marginibus pectinato-ciliatis. Petala unguiculata, filiformia, 4—4·5 mm. longa, 0·3 mm. lata, unguibus parce pectinato-ciliatis. Stamina glabra. Staminodia anguste filiformia, circ. 3 mm. longa, inferne pectinato-ciliata. Ovarium albosum, stylo filiformi, inferne patenter piloso.

Cape Province: South-Western Region; Clanwilliam Div., stony places, Packhuisberg, 2000 ft., August, 1897, *R. Schlechter*, 10803! (in Herb. Bolus and Albany Museum).

Another member of the section *Euagathosmae* of Group C of Sonder, nearest to *A. capitata*, Sond., but characterised by its creeping sprawling slender habit, slightly pilose twigs, scarcely trigonous, longer, obtusely keeled, sparsely pilose, minutely denticulate leaves, shorter pedicels with basilar bracteoles, very slender filiform petals, with slightly pilose claws, more slender staminodes, and style patently pilose below the middle.

Superficially it resembles a slender creeping form of *A. florida*, Sond. (*A. mollis*, Eckl. and Zeyh., but not of Bartling and Wendland). The very slender filiform petals are a characteristic of this species. In infancy the flower heads are red, eventually changing to creamy white.

A. paludosa, *A. erectae* forsitan proxime accedit, sed facile distinguitur ramulis glabris, foliis adpressis, dorso convexis, umbellis capitatis majoribus, fere orbicularibus, bracteis scariosis, pedicellis brevioribus.

Fruticulus gracilis, ad 0.5 m. altus, ramis paucis fastigiatis vel rectis, albidis, glabris. Folia adpressa, vix imbricata, fere amplexicaulia, demum ascendentia, per breviter petiolata, lanceolata, paululo callosobtusata, circiter 4 mm. longa, 1—1.3 mm. lata, coriacea, utrinque glabra, supra concava, subtus convexa, obscure punctato-glandulosa, margine primo laxe pilosa, mox glabra, integra. Umbellae capitatae, fere orbiculares, congestiflorae, 1.5 cm. diam., albae; bracteis late ovatis, fere rotundatis, circ. 2 mm. longis, concavis, scariosis, pectinato-ciliolatis; pedicellis 1—1.5 mm. longis, glabris, bracteolis binis, basilaribus elliptico-oblongiusculis, scariosis, 1.3 mm. longis, ciliolatis. Calyx 1.7 mm. longus, utrinque glaber, segmentis late deltoideis, obtusis, dorso obtuse carinatis, margine pectinato-ciliolatis. Petala unguiculata, 4—4.5 mm. longa, lamina late elliptica, rotundata, 1.7 mm. lata, glabra, unguibus medio parce pectinato-pilosis. Stamina glabra. Staminodia oblanceolata, 3—3.5 mm. longa, sub apice glandula notata, medio patenter pilosa. Pistillum superne longe albo-pilosum, stylo inferne albo-piloso.

Cape Province: South-Western Region; Ceres Div., nr. Laaken Vley, Matroosberg, 5000 ft.?, Nov., 1917, *Dr E. P. Phillips*, 1967! (in Herb. S.A. Museum, 11767).

One of the section *Euagathosmae* perhaps nearest to *A. erecta*, B. and W., and its forms, but easily distinguished by its glabrous twigs, relatively larger, adpressed, dorsally convex, less thickish leaves, the larger almost orbicular capitate umbels, the scarios bracts, the shorter glabrous pedicels, and floral distinctions.

A. muizenbergensis, var. *planitiensis*.

Fruticulus robustus, ad 0.5 m. altus. Folia lanceolato-subulata, obtusiuscula, ad 1.5 cm. longa, dorso costato-carinata, apicem versus paululo gibbosa, margine primo parce pectinato-ciliata. Pedicelli pilosi, pilis ascendentibus, undulatis. Calycis lobi pilosi, 2 mm. longi.

Cape Province: South-Western Region; Cape Div., among short Restiaceae and bushes, in sandy flats east of Mowbray, 10th Aug., 1912, *N. Pillans*, 1901! (in Herb. Pillans, 1901).

A peculiar variant and new record for the Cape Peninsula Flora, distinguished from the type—a montane species—by its more robust habit, the leaves, when young, being marginally and dorsally pectinate-ciliate, and relatively longer, with a slight dorsal subapical gibbosity, by the pubescence of the pedicels which is of an ascending and wavy nature (and not stiff and patently spreading), by the ciliate calyxlobes, and the slightly larger and flesh-coloured flowers. Superficially not unlike *A. Dummeri*, Phillips, from the French Hoek Mountains, but more dwarf.

REVIEW

THE GRASSES AND GRASSLANDS OF SOUTH AFRICA. BY J. W. BEWS, M.A., D.Sc. *Pietermaritzburg, P. Davis and Sons, Ltd.* (1918).

UNTIL the publication in 1898-1900 of the thorough and scholarly account of the South African Grasses by O. Stapf in the seventh volume of the *Flora Capensis*, workers on South African species of grasses had to rely in the main on Nees' treatise on S.A. Gramineae first published in 1841. Only one work of outstanding importance, dealing however only with one group, the Andropogoneae, had in the interval been issued by Hackel in the *Monographiae Phanerogamarum*, vol. VI (1889), edited by A. and C. De Candolle. After the issue of Stapf's work the late Dr J. M. Wood illustrated about 200 species in *Natal Plants*. On the whole the S.A. Grasses are now better known from a taxonomic point of view than most other families. The way was thus opened for their study from other points of view. Stapf led off by his interesting phytogeographical treatise *Die Gliederung der Graeserflora von Suedafrika* (Berlin, 1904). During more recent years Dr Bews has given us a series of most valuable studies of the plant-succession in S. Africa, special attention having been given to the grasslands and we are, therefore, very grateful to him that he has summarised some of these researches in the present book and added new observations and conclusions. The ecological study of such a large group of plants scattered over such a wide area under very diverse conditions naturally cannot be expected to yield anything like finality in a few years' work, but already it seems that much of what Dr Bews has written on the subject will at all events serve as a firm foundation for future investigation. Any criticism that the writer has to offer must, therefore, be looked upon as entirely overshadowed by the solid worth of the book which has been to him already a frequent source of instruction and even inspiration.

The book opens with an introduction dealing with a general description of grasses, with plant-succession and a glossary of botanical terms. The terminology used in the description of the spikelet is the same as that employed by British authors generally and unfortunately also in the *Flora Capensis* which altogether blurs the morphological interpretation and correlation of its parts. The terminology used by most continental botanists seems to be much simpler and more logical. It might have been advisable for Dr Bews to mention that he describes a typical spikelet and that deviations

from the type are not infrequent. In the ecological parts Clements' terminology has been adopted. Let us hope that these represent a "socioes" and not a "society" and that somebody will soon propose terms more acceptable than "prisere," "oxyseres," etc.

The second chapter gives an artificial key to the genera and species of S.A. Grasses. There is certainly a need for such a key as even a professional botanist cannot always get satisfactory results with Stapf's keys in the *Flora Capensis*. Whether Dr Bews has succeeded where such a masterhand has not always given satisfaction can only be found out by prolonged use for which the writer has had no opportunity yet. Hackel has stated that amongst grasses "no single tribe, no large genus numbering over 50 species can be definitely characterised," and it seems, therefore, hopeless to expect a satisfactory key for the genera.

With the third chapter giving "ecological notes on the principal species in each genus" we leave the dry bones and enter upon a portion of the subject in which the author is particularly at home. This, like the two concluding chapters, will appeal to a wide circle of readers both in South Africa and abroad. The fourth is the longest chapter. It gives a "general sketch of the grasslands of South Africa and their development." In the last chapter "economic applications" are dealt with. This is followed by an appendix containing a list of English, Dutch, Zulu and Sesuto names of grasses.

The mass of facts in the three last chapters is very imposing. A few points only can be referred to here. Transverse sections of the leaves of a number of grasses are diagrammatically illustrated chiefly with a view to demonstrate the amount of sclerenchyma in them which the author correlates with the nutritive value of grasses as pasturage. This is a happy inspiration which no doubt gives useful indications, but a word of caution is required not to carry its application too far. In the first place the anatomy of grassleaves varies considerably according to locality (and perhaps also according to varying seasonal rainfall). Further it seems to the writer that the amount of silica in the leaves should be taken into account and lastly, stock do not only eat grassleaves but also grass-stems and their anatomy should be studied side by side with that of the leaves. *Danthonia purpurea*, a valuable pasturage grass although xerophytic, to which Dr Bews had introduced us in a previous publication, is again fully dealt with. No doubt we shall soon hear of its introduction into the more arid parts of America and Australia, after which our South African farmers will realise its value.

Some of the vital questions affecting the future prosperity of South Africa are grass-burning, overstocking and the attendant evil of soil-erosion. On all these Dr Bews gives most valuable information and it will always be to his credit that he was the first to show that, while in certain places and under certain conditions the burning of the veld should be stopped, in other places

and under other conditions it is not only advantageous but necessary. Once his ideas can be worked out in detail for large parts of South Africa and adopted by our farmers, a new era will have begun in many of the stock-farming districts of South Africa.

In conclusion we would express our appreciation of the manner in which the book has been turned out by the publishers. It is printed in clear type and there are remarkably few misprints in it.

S. S.

EXPLANATION OF PLATES

PLATE I

- A. *ADENANDRA UMBELLATA*, WILLD. B. *CAESALPINIA PEARSONII*, L. BOLUS.
C. *PLUMBAGO PEARSONII*, L. BOLUS. D. *DIOSMA MARLOTHII*, DUMMER.
- A. Fig. 1, sketch of branchlet, nat. size; 2, portion of disc with two stamens and three staminodes, from a young flower; 3, stamen from Fig. 2, front, back, and side view; 4, as in Fig. 2, but at a later stage of development; 5, a stamen from Fig. 4, front, back, and side view; 6, portion of disc with bases of stamen and staminode, showing nectariferous foveole; 7, gynaeceum in a recently opened flower; 8, ditto, at a later stage—all variously enlarged.
- B. Figs. 1 and 2, portions of branches, nat. size; 3, flower; 4, calyx, laid open; 5—9, petals; 10, stamens with calyx-tube; 11, gynaeceum, portion of ovary removed; 12, stigma—variously enlarged; 13, legume; 14, seed, nat. size.
- C. Figs. 1 and 2, portions of branches; 3, leaf, nat. size; 4, sepal; 5, flower, laid open; 6, stamen; 7, gynaeceum; 8, section of ovary; 9, fruit; 10, seed—variously enlarged.
- D. Fig. 1, branch, nat. size; 2, leaf; 3, transverse section of ditto; 4, sepal; 5, longitudinal section of flower; 6, petal; 7, stamen, front view; 8, ditto, back view; 9, gynaeceum.

PLATE II

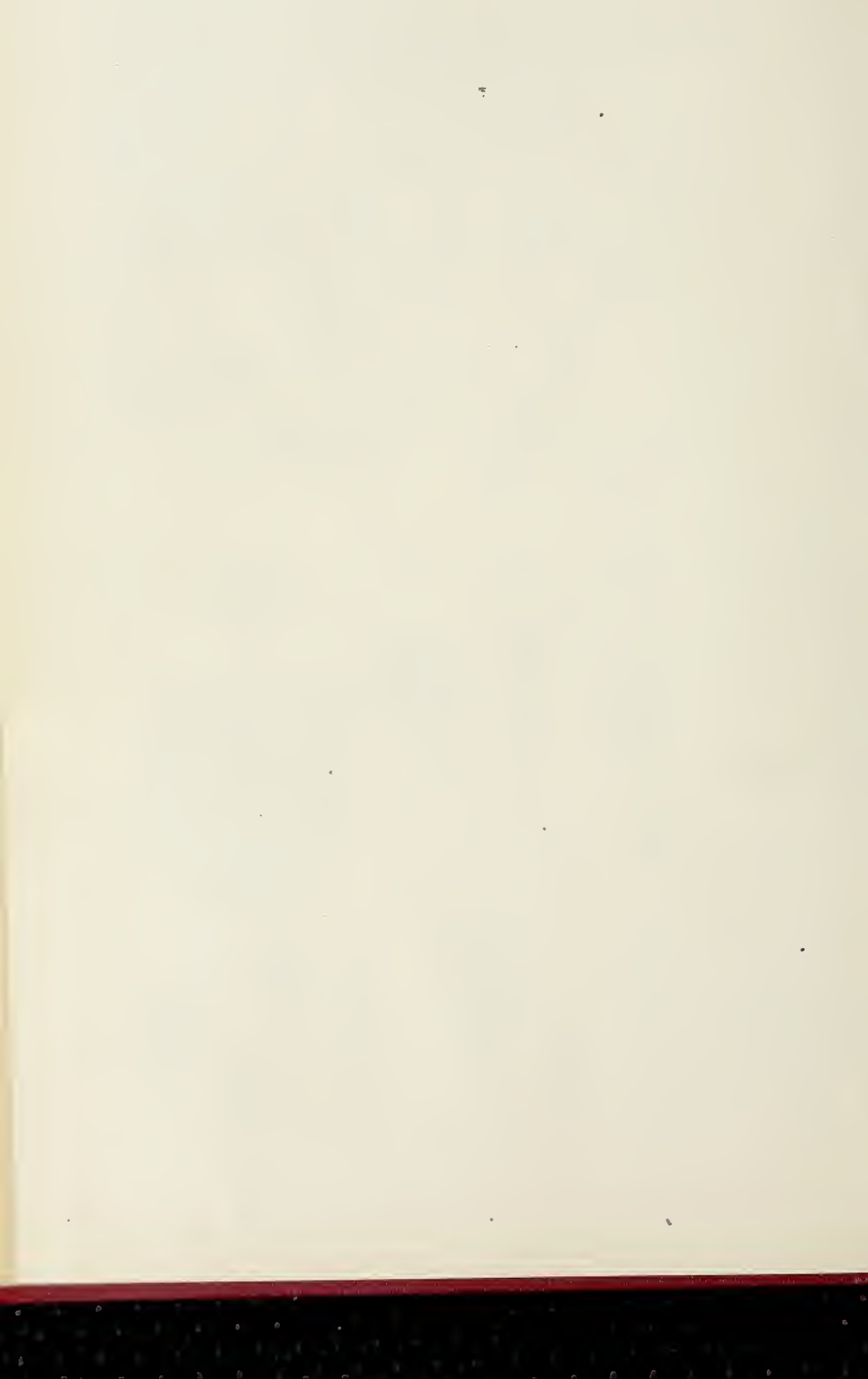
- A. *HOMERIA LILACINA*, L. BOLUS. B. *HOMERIA BIFIDA*, L. BOLUS.
C. *AGAPANTHUS WALSHII*, L. BOLUS. D. *APICRA RUBRIFLORA*, L. BOLUS.
- A. Fig. 1, outer perianth-segment; 2, inner ditto—from a small flower; 3, androecium and gynaeceum; 4, style-branches—variously enlarged.
- B. Fig. 1, outer perianth-segment; 2, inner ditto; 3, androecium and gynaeceum; 4, gynaeceum—portion of ovary removed; 5, style-branches—variously enlarged.
- C. Fig. 1, apex of peduncle with one flower, nat. size.
- D. Fig. 1, flower; 2, ditto, laid open—enlarged.



In m. Page

A. *Adenandra umbellata*, Willd.

B. *Cuesalpinia Pearsonii*, L. Bolus.





M. M. Poore

- A. *Homeria lilacina*, L. Bolus.
- B. *Homeria bifida*, L. Bolus.
- C. *Agapanthus Walshii*, L. Bolus.
- D. *Apiera rubriflora*, L. Bolus.



A NEW GENUS OF CRASSULACEAE

BY S. SCHONLAND.

PAGELLA nov. gen.

Herba nana carnosae, flore Crassularum tetramerarum, sed ovario syncarpo, apice valde applanato, stylis liberis minutissimis. Fructus capsularis, maturus ignotus, verisimiliter circumscissus, immaturus pericarpio tenuissimo.

Species unica.

P. Archeri n. sp.

Herba annua carnosae, radicibus fibrosis, caule primum obconico, deinde disciformi, dense foliis et floribus tecto. Folia ad marginem disci numerosa, dense rosularia, parva carnosae, inferne cuneata, subplana, pallide viridia, superne ampliata et incrassata, oblique truncata, papillosa, saturate viridia. Inflorescentia centralis plana multiflora, floribus sessilibus tetrameris haplostemonis, bracteis foliis similibus sed multo minoribus. Sepala basi parum connata, foliis similia sed minora, apice triangularia truncata papillosa, quam petala multo breviora. Petala basi connata, late obovato-cuneata, apice acutiuscula, parum corrugata, microscopice papillosa, suberecta, apicem versus incurva, primum saturate rubra, post anthesin pallide rosea, denique marcescentia sordide alba, persistentia. Stamina cum petalis alternantia, parte basilari iis adnata, quam petala breviora, filamentis abrupte incurvis, e parte inferiore dilatata subulatis, antheris dorsifixis, oblongis. Ovarium 4-loculare depressum, summo applanatum microscopice papillosum, 4-sulcatum, in medio profunde excavatum, multiovulatum, stylis liberis minutissimis, stigmatibus minutissimis oblongis. Squamae quam ovarium parum longiores albae, anguste lineares, apice parum dilatatae. Fructus capsularis polyspermus, maturus ignotus sed verisimiliter circumscissus, immaturus pericarpio tenuissimo.

Plantae ad 21 mm. latae. Folia circ. 3 mm. longa. Flores $1\frac{1}{2}$ —2 mm. lati. Sepala et stamina circ. $\frac{1}{2}$ mm. longa. Petala circ. 1 mm. longa. Ovarium circ. $\frac{1}{4}$ mm. altum.

Cape Province: South-Western Region; Montagu Div., frequentissima cum muscis inter Mesembrianthema prope "Montagu Baths." Mary M. Page, Aug. 1920 (Bolus Herbarium, No. 16645).

Karoo Region; Matjesfontein, fl. Sept. 1920, Archer (Bolus Herbarium, No. 16646).

I have taken the liberty of associating the discoverer of this most interesting and charming little plant, Miss Mary M. Page, with the generic name I have given to it. I owe the privilege of examining and describing it to the kindness of Mrs F. Bolus who has done so much already for the study of the South African Flora. When I first glanced at it, I thought Mrs Bolus had sent me a liverwort, but of course an examination of it showed at once that it was a crassulaceous plant not essentially different in floral structure from the species of *Crassula* with tetramerous flowers except by the decidedly syncarpous ovary. In many species of *Crassula* and other genera of *Crassulaceae*, the carpels are slightly united at the base. In *Diamorpha*, *Penthorum* and *Triactina* one finds even ovaries that can be considered syncarpous in the accepted sense of the term, but in none of them has syncarpy proceeded so far as in *Pagella* which cannot be placed into any of these genera. It is the only known crassulaceous plant in which a haplostemonous androeceum is associated with syncarpy, and it is moreover the only crassulaceous plant with syncarpous ovary known from the Southern Hemisphere. In adding an English description of the plant I will take the opportunity of making a few remarks here and there which are not included in the Latin diagnosis.

The roots are fibrous and there can be no doubt that the plant is an annual. The stem is succulent. Until the plant is about 7 mm. in diameter the stem is obconical, then it flattens out and in the older specimens the obconical shape has practically disappeared and the stem is disc-shaped. The older leaves have by that time withered and the disc bears on its top a large number of closely packed sessile flowers surrounded by 2-3 quasi-rows of also very closely packed foliage leaves, the whole resembling very closely a flat capitulum of some *Compositae*, except that in *Pagella* the inflorescence is evidently cymose, though, owing to the crowded state of the flowers, no further analysis of their relative position was possible. The largest plant I have seen was 1.8 by 2.1 cm. in diameter and about 3 mm. thick. Its surface area was, therefore, only a little over 3 sq. cm. and yet it bore over 60 flower-buds and flowers. The floral bracts are frequently suppressed. The foliage-leaves are about 3 mm. long. They have a thin, flat, smooth, cuneate basal portion (about $1\frac{1}{2}$ mm. long) and an enlarged thickened deep green apical portion which is obliquely truncate and papillose at the top. The flowers are $1\frac{1}{2}$ —2 mm. in diameter, tetramerous, haplostemonous, distinctly proterandrous. The sepals are slightly connate at the base, about half the length of the petals, somewhat similar to the foliage-leaves but much smaller, the truncate apical portion triangular. The petals are broadly obovate-cuneate, slightly contracted and a

little pointed at the apex, connate at the base, slightly crinkled, microscopically papillose, bent in the upper portion towards the centre of the flower, about 1 mm. long, persistent, in bud deep red, in the open flower paler, later marcescent and dirty white. Stamens alternating with the petals, attached to their basal connate portion, half their length, bent sharply inwards through the chinks between the posterior portions of the carpels. Filaments from a broadish base subulate. Anthers brown, dorsifixed, oblong. Pollen yellow. The ovary fills the interior of the flower touching the petals. It is 4-chambered, 4-sulcate, depressed, almost flat on the upper surface and here microscopically papillose. In the centre, where the four grooves meet, there is a deep depression, close to which there are the four extremely minute free styles each of which bears an extremely small oblong stigma. The ovary is pale green except round the bases of the styles, where there is a little suffusion of red. The "squamae" are a little longer than the height of the ovary, white, narrowly linear, slightly broadened towards the apex. It seemed to me that they are absent in some flowers, but on this point I could not quite make sure. The ripe fruits have not been seen yet. Fruits which were evidently nearly ripe were very slightly larger than the ovary in the open flower. They had a very thin pericarp which could easily be detached all round near the base of the ovary. It is, therefore, most likely that the fruit is a circumscissile capsule. The seeds are fairly numerous, oblong. They are attached to comparatively long funicles.

In conclusion a few words on the placentation which is somewhat peculiar. Unfortunately we know too little of the placentation of other crassulaceous plants, especially of the small *Crassulae* which I have united under the section *Tillaeoideae*, to express an opinion whether this placentation is unique in the order. In each chamber of the ovary there are two quite separate placentas on the upper portion of the lateral walls near the inner angles of each chamber. Their shape and position will be seen from the accompanying figures (13, 14). Each bears numerous ovules. (Pl. III, A.)

NOVITATES AFRICANAE

Impatiens Duthieae, J. Bolus (Balsaminaceae), ab *I. capensi* floribus multo minoribus, petalis bilobis, auriculis rotundatis distinguitur.

Herba gracilis glaberrima diffusa, ramis elongatis decumbentibus, saepe reptantibus, ca. 0.3 cm. ad 0.5 cm. diam.; folia saepius patentia ovata, obtuse acuminata, in petiolum alatum 1—1.8 cm. longum angustata, crenata, crenaturis spinuliferis, nervo medio pagina superiore prominente, nervis primariis saepius 5-jugis, pagina inferiore prominentibus, lamina saepius 3—4 cm. longa; cymae 1—3-fl., pedunculis brevissimis, pedicellis gracilibus, demum ad 5 cm. longis; sepalum dorsale ovatum acutum concavum, 0.6 cm. longum, calcare gracillimo, 1.2 cm. longo, sepalis lateralibus linearibus vel lineari-lanceolatis, 0.3 cm. longis; petala lateralia 1.1 cm. longa, 0.7—0.8 cm. lata, erecta concava unguiculata, lamina late obovata, inaequaliter biloba, lobo anteriore rotundato, posteriore multo angustiore obtuso, auricula subrotundata, 0.2 cm. longa; petalum anterius concavum, ore oblongo, minute apiculatum, 0.7 cm. longum, 0.3 cm. latum; stamina 0.3 cm. longa; capsula acuminata, 1.6 cm. longa, medio 0.6 cm. diam., seminibus obovatis, 0.2 cm. longis.

Cape Province: South-Western Region; Knysna, *A. V. Duthie* (Bolus Herbarium, No. 15191). Flowered freely during the summer months for the last three or four years in the National Botanic Gardens at Kirstenbosch, where it grows on the edge of a pool, sending out branches which float in masses on the surface of the water.

Distinguished from *I. capensis*, Thunb. by the much smaller flowers, bilobed petals with rounded auricles.

Dolichos Peglerae, L. Bolus (*Leguminosae-Phaseoleae*), *D. Lablab* affinis, sed bracteolis minutis, mox deciduis, floribus majoribus (2.5 cm. longis), vexillo ovato galeato, carina haud rostrata facile distinguitur.

Suffruticosus, caule volubili hispido, setis reflexis; foliola rhomboido-ovata subobliqua acuta apiculata, terminalia lateralibus majora, 3—7 cm. longa, 2—4.5 cm. lata; pedunculus subrobustus nudus, 7—20 cm. longus; axis floriferus 4—14 cm. longus, nodulosus, nodis 5—7 flores purpureos emittentibus, internodiis 0.3—3 cm. longis vel ultra; pedicelli 0.2—0.9 cm. longi, erecti vel adscendentes, apicem versus decurvati, apice articulati et bracteolis binis lineari-oblongis, ca. 0.15 cm. longis onusti; calyx basi subintrusus, hispidulus, ad 0.5 cm. longus; labium superum emarginatum, demum fere integrum, labium inferum

breviter 3-dentatum; vexillum ovatum galeatum, supra medium carinatum, basi auriculatum, auriculis crassis, lamina ad 2.3 cm. longa, ungue vix 0.2 cm. longo, callis oblongis, apice rotundatis, ad 0.3 cm. longis; alae oblique ovatae, lamina ad 1 cm. longa, ungue ad 0.4 cm. longo; carina obtusa, ca. 2 cm. longa; filamenta stylo aequilonga, antheris simillimis, 0.1 cm. longis; ovarium stipitatum lineare hispidulum, saepius 5-ovulatum, stylo flexu dilatato glabro, deinde tereti, dense barbato, stigmate capitato; legumen immaturum subfalcatum, 4 cm. longum.

Cape Province: South-Eastern Region; Transkei, Kentani, along streams, fl. Feb.—March, *Alice Pegler*, 1178. Flowered freely for several years during March at Kirstenbosch from seeds sent by Mr Stayner from Enkazini Forest, Natal (National Botanic Gardens, No. ²¹⁵⁹/₁₅).

Allied to *D. Lablab*, but is easily distinguished by the minute bracteoles which are deciduous at a very early stage, by the larger flowers (2.5 cm. long), ovate galeate vexillum, and the non-rostrate carina.

This is probably the handsomest of the South African species of *Dolichos*. The petals on first opening are a reddish purple, the vexillum having an M-shaped clear-yellow blotch at the base of the blade, bordered by a narrow band of deep purple. Later in the day the colour changes to a beautiful mauve, and the yellow grows fainter, finally becoming a bluish white. The gradation of shades, therefore, that is to be found in a flower-cluster is very varied and gives a most charming effect to the whole.

Mesembrianthemum Peacockiae, L. Bolus (*Ficoideae-Mesembricae*), sectioni "Scabrida" convenit, sed ab omnibus ceteris caule graciliore reptante, foliis semiteretibus, floribus solitariis distinguitur.

Caulis gracillimus reptans flexuosus, ramis erectis, saepissime ad 3 cm. altis (pedunculo excluso); folia adscendentia, deinde patula, basi connata, semiteretia acuta purpureo-apiculata, glauca vel in cultis viridescencia, punctata, punctis ad lucem pellucidis, 0.6—0.9 cm. longa, basi vix 0.2 cm. lata; pedunculi erecti graciles, medio vel infra 2-bracteati, bracteis foliis paullo majoribus, 1-fl., floribus 5-meris, 2.5—3 cm. diam.; calyx clavatus punctatus, segmentis subaequilongis lanceolatis acuminatis, duobus late membranaceo-marginatis, membrana atrobrunnea, 0.4—0.5 cm. longis; petala stricte radiata, 1-seriata, saepissime obtusa, basin versus gradatim attenuata, pallide rosea, apicem versus marginibusque purpurascentia, 1—1.2, rarissime ad 2 cm. longa, vix ad 0.2 cm. lata; stamina conferta, ca. 0.3 cm. longa, filamentis basi barbatis albidis, superne purpurascentibus, antheris luteis;

discus annularis crenulatus; ovarium convexum, stylis erectis, apice patentibus subulatis setaceo-acuminatis, 0.25 cm. longis.

Cape Province: South-Western Region; near Darling, fl. Sept., *W. Peacock* (National Botanic Gardens, No. $\frac{1669}{17}$); Malmesbury Div., near Kalabas Kraal, fl. Sept., *L. Bolus* (Bolus Herbarium, No. 15192). Cape Peninsula, Lion Mountain, *L. Guthrie*.

Allied to the section "Scabrida" on account of its punctate leaves and the general look of the flower, but differs from all the other species in this section in its more slender creeping stem, semi-terete leaves, and solitary flowers.

Described from living specimens which flowered freely at Kirstenbosch during the spring, 1918—1920.

Mesembrianthemum Watermeyerii, L. Bolus, caulescens epapulosum, glaberrimum, foliis basi perbreviter connatis vel fere liberis, semiteretibus, apicem versus obscure carinatis, floribus saepius 3-natis, 5-meris.

Fruticulus erectus robustus rigidus, 25 cm. altus vel ultra; rami teretes vel juniores subcompressi, ad 0.7 cm. diam., folia erecto-incurva, vel suprema patentia, acuta, 2—3.5 cm. longa, 0.5—0.6 cm. diam. lataque; pedunculi omnes bracteati vel rarius intermedii ebracteati, ad 4 cm. longi; calyx turbinatus, segmentis inaequalibus, basi ovatis, apicem versus teretibus acuminatis, duobus conspicue membranaceo-marginatis, 1.3—1.6 cm. longis; petala ca. 3-seriata acuta alba, ad 2.5 cm. longa, 0.1—0.2 cm. lata; stamina leviter incurva vel erecta, filamentis flavidis, basi barbatis, 0.6 cm. longis, antheris minutis luteis; discus annularis, minute crenulatus; ovarium supra convexum, stylis crassis ovatis setaceo-apiculatis, ad 0.35 cm. longis.

Cape Province: Upper Region; Calvinia Div., Nieuwoudtville, *E. B. Watermeyer* (National Botanic Gardens, No. $\frac{2256}{15}$).

Caulescent epapulose, quite glabrous, the leaves very shortly connate at the base or almost free, semi-terete, obscurely keeled towards the apex, the flowers usually 3-nate, pentamerous.

Described from living specimens which flowered at Kirstenbosch, in Oct.

Erica plena, L. Bolus, *E. campanulatae* affinis, sed foliis brevioribus, bracteis longioribus angustioribusque, corollis longioribus et pro parte angustioribus, filamentis longioribus, antheris oblique ovatis differt.

Fruticulus erectus ca. 40 cm. altus; rami ramulique graciles, juniores tenuiter tomentosi, dense foliosi; folia 4-nata, adscendentia, dense imbricata, anguste linearia, subobtusa glabra, praeter petiolum brevem ciliatum, 0.3—0.4 cm. longa, ca. 0.05 cm. lata; flores solitarii, ramulos crebros breves terminantes; pedunculi adscendentes glabri, 0.25 cm. longi, bracteis 3 infra medium positis, anguste linearibus, ciliatis, ad

0.3 cm. longis; sepala ovata caudato-acuminata colorata, 0.4 cm. longa; corolla tubularis glabra, 0.9 cm. longa, segmentis erectis, apice rotundatis, 0.2 cm. longis; stamina inclusa, apicem tubi corollae vix attingentia, antheris muticis vel filamento minute denticulato, oblique ovatis, obtusis, vix 0.1 cm. longis, poro dimidio lobi aequilongo; ovarium obovatum glabrum, vix 0.2 cm. longum, stylo fere apicem corollae attingente, stigmatibus capitellato.

Cape Province: exact locality unknown.—Obtained by Mr N. S. Pillans at the Caledon Wild Flower Show, Sept. 1910 (*Pillans*, 1678).

Allied to *E. campanulata*, Andr., but differs in having shorter leaves, longer and narrower bracts, longer and proportionately narrower corollas, longer filaments, and obliquely ovate anthers.

Described from dried specimens. No record of the colour of the living flowers has been made, but they appear to have been a flame-colour. The specific name is given in reference to the richly-flowered branches. (Pl. III, c.)

Erica Eustacei, L. Bolus, *E. spectabili* affinis, sed pedunculis brevioribus, antheris cristatis, cristis liberis, ovario villosa, ceterisque distinguitur.

Fruticulus rigidus, ramis ad 30 cm. longis, junioribus tomentosis; folia erecta 3-nata subconcava, dorsaliter convexa, pagina superiore tenuiter pubescentia, pectinato-ciliata, 0.2—0.3 cm. longa, internodios aequantia vel excedentia; flores 3-nati; pedunculi saepius decurvati, minute glanduloso-pubescentes, 0.2 cm. longi, bracteis duobus approximatis, tertia medio posita, lanceolato-oblongis, 0.15 cm. longis; sepala ovata acuminata ciliata, 0.2 cm. longa; corolla globose suburceolata, basi 4-sulcata, glabra, leviter viscidula, 0.3 cm. longa, segmentis erectis obtusis, ca. 0.1 cm. longis; stamina inclusa, antheris triangulari-ovatis, lobis distinctis subdivaricatis, ca. 0.05 cm. longis, cristatis, cristis angustis integris, lobo brevioribus, poro dimidium lobi parum excedente; ovarium depresso globosum villosum, stylo incluso, staminibus aequilongo, stigmatibus simplicibus.

Cape Province: Karroo Region; mountains on Tweedside Farm between Matjesfontein and Constable, fl. Sept., *Eustace Pillans* (*Pillans*, 1609).

Near *E. spectabilis*, Kl., but may be distinguished by the shorter peduncles, crested anthers with the crests free, villous ovary, and by other characters.

Described from dried specimens. "Flowers very pale pink." (Pl. III, d.)

Erica Stokoei, L. Bolus, *E. irregulari* affinis, sed foliis brevioribus, dense imbricatis, floribus aggregatis (more *E. seriphifoliae*) minoribus, bracteis duobus, ovario hispidulo differt.

Fruticulus rigidus humilis, ad 21 cm. altus, ramis dense foliosis,

senioribus cicatricibus foliorum delapsorum conspicue notatis; folia 4-nata erecta, dense imbricata, linearia subacuta, ad 0.5 cm. longa, petiolo 0.1 cm. longo; flores 4-nati, ad apices ramulorum aggregati; pedunculi decurvati, tenuiter tomentosi, 0.6 cm. longi, bracteis 2, medio vel supra medium positus, ad 0.3 cm. longis; sepala ovata subapiculata pectinato-ciliolata colorata, 0.3 cm. longa; corolla subcylindrica vel subcylindrica, basi tetragona, sulcis sepalis oppositis, glabra vel puberula, 0.35 cm. longa, segmentis oblongis, apice rotundatis, tubum aequantibus vel parum excedentibus; stamina inclusa, antheris suboblongis obtusis, basi obliquis, fere 0.1 cm. longis, anguste cristatis, poro dimidium lobi excedente; ovarium depresso globosum hispidulum, praecipue apicem versus, stylo corolla brevior, stigmate capitato.

Cape Province: South-Western Region; Caledon Div., Stanford, fl. Nov., *T. P. Stokoe* (Bolus Herbarium, No. 16070).

Allied to *E. irregularis*, Benth., but differs in having shorter and more densely imbricate leaves, flowers collected towards the end of the branches (as in *E. seriphiifolia*, Salisb.) and smaller, two bracts, and the ovary hispidulous.

Described from dried specimens. Flowers pink. (Pl. IV, D.)

Erica Goatcheriana, L. Bolus, *E. lanipedi* affinis, sed robustior, foliis crassioribus subglaucis, ramis ramulisque dense tomentosis, pedunculis multo brevioribus crassioribusque, corolla angustiore, segmentis multo brevioribus basi vix cordatis.

Fruticulus erectus robustus, ramis dense foliosis, ad 30 cm. longis, 0.3 cm. diam., cum ramulis pedunculisque dense cano-tomentosis, capillis barbellatis; folia adscendentia vel erecta, linearia subacuta glabra, minute ciliolata, subglaucis, dense imbricata, 0.4—0.9 cm. longa; pedunculi decurvati, 0.8 cm. longi, bracteis duobus medio, tertia parum infra medium positus, obovato-oblongis apiculatis glabris, 0.6 cm. longis; sepala obovato-oblonga vel ovalia, 0.6—0.7 cm. longa; corolla elongato-urceolata, ad os gradatim angustata, glabra, 1 cm. longa, segmentis leviter patentibus vel suberectis, apice rotundatis, 0.15 cm. longis; stamina inclusa, filamentis complanatis, 0.3 cm. longis, fere 0.1 cm. latis, antheris lineari-lanceolatis acutis, basi obliquis, 0.25 cm. longis, cristatis, cristis rotundatis crenulatis, poro lobi dimidio aequilongo; ovarium globosum glabrum, stylo incluso, stamina parum excedente, stigmate simplici.

Cape Province: South-Western Region; Ceres Div., fl. Oct. (Bolus Herbarium, No. 16653). Obtained at the Cape Town Wild Flower Show, Oct. 1920.

Allied to *E. lanipes*, Guthr. and Bolus, but may be distinguished by the more robust habit, thicker, rather glaucous leaves, tomentose

branches and branchlets, much shorter and thicker peduncles, narrower corolla, with much shorter segments, which are scarcely cordate at base.

Described from dried and living specimens. Flowers cream, usually flushed with a purplish pink. Named in honour of Mr A. W. Goatcher, for long a resident at Ceres and keenly interested in the preservation of its beautiful flora. (Pl. IV, c.)

Klattia Stokoei, L. Guthrie (*Irideae-Sisyrinchieae*), *K. partitae* valde affinis, sed foliis patentioribus latioribusque, perianthii tubo multo brevior, segmentis angustioribus, lamina rubra, capsula majore distinguitur.

Suffruticosa glabra, ca. 0.6 met. alta; rami ancipites, reliquis foliorum delapsorum conspicue notati; folia equitantia ascendentia, ad apices ramulorum aggregata, linearia, apicem versus angustata, acuta mucronata, rigida, crebre nervosa, nervis in vivo inconspicuis, superiora fere omnino rubra, 9—15 cm. longa, 0.8—1.4 cm. lata; flores in capitula terminalia aggregati, capitulis ca. 8-fl., spathatis, spathae foliis 2, saturate rubris, inaequalibus, exteriore 5.6 cm. longo, 2.5 cm. lato, interiore 2.3 cm. longo, 1.5 cm. lato, apice rotundatis, carinatis, carina apicem versus dilatata, excurrente; bracteae lanceolatae papyraceae albae, 1.8—2.2 cm. longae, 0.4 cm. latae; perianthii tubus brevissimus, ca. 0.15 cm. longus, 0.2 cm. diam., segmentis inter se inaequalibus, 5.6—6.2 cm. longis, lamina lineari, ca. 1.6 cm. longa, in unguem filiformem gradatim attenuata; stamina ad os tubi affixa, fere perianthio aequilonga, antheris sagittatis, 0.6 cm. longis; ovarium turbinatum rostratum, 0.3 cm. longum, 0.2 cm. diam., loculis 1—2-ovulatis; capsula 1.3 cm. longa, rostra 0.2 cm. longa, valvis ad 0.25 cm. latis; semina linearia anteriore concava, posteriore 2-sulcata argentea, 0.8 cm. longa, 0.2 cm. lata.

Cape Province: South-Western Region; Caledon Div., Steenbraas River Valley, eastern mountain-slopes, among stones, fl. Jan. 1921, *T. P. Stokoe* (Bolos Herbarium, No. 16906).

Very closely allied to *Klattia partita*, Baker, but may be distinguished by the more spreading and broader leaves, much shorter perianth-tube, narrower perianth-segments with the blade red, and by the larger capsule.

Described from living material supplied by Mr T. P. Stokoe.

Watsonia Pillansii, L. Bolus (§ *Euwatsonia*) [*Irideae-Ixieae*], *W. Merianae* affinis, sed caule saepissime simplice, spica densiore, vaginis, foliorum reductorum haud ventricosis, staminodiis adeuntibus, ceterisque differt.

Erecta, omnino glabra, ad 2 met., saepius 1.25 met. alta; cornus depresso globosus; folia radicalia circa 4—5, linearia, ad apicem atten-

uata, tenuiter nervata, marginibus haud conspicue incrassata, 0.70 met.—1.10 met. longa, ad 2.5 cm. lata; spica simplex, densa, ad 37 cm. longa; bracteae oblongae obtusissimae, 1.7—2.7 cm. longae, ad 1.2 cm. latae; bracteolae fere ad apicem connatae, acutae, 1.9 cm. longae; perianthium testaceum, ca. 7.3 cm. longum, tubo fere 5 cm. longo, basi 0.2 cm., apice 1 cm. diam., segmentis vix patentibus, ovalibus, exterioribus medio 1.1, interioribus 1.3 cm. latis; staminodia 3, 1.2 cm. longa, apice vera ab perianthio libera; stamina 6.5 cm. longa, filamentorum parte libera 3.9 cm. longa, antheris 1 cm. longis; stylus 5.3 cm. longus, ramis primariis 1—1.2 cm. longis, secundariis 0.5—0.6 cm. longis; capsula cylindracea, basin versus parum angustata, 2.3 cm. longa, apice 1 cm. diam.; semina subtriangularia, oblique alata, pallide brunnea, 0.7 cm. longa.

Cape Province: South-Western Region; George Div., Montagu Pass, *N. S. Pillans* (National Botanic Gardens, No. $\frac{1549}{14}$).

Allied to *W. Meriana*, Mill., but may be distinguished by the usually unbranched stem, denser spike, the sheathing base of the reduced leaves not being ventricose, the presence of staminodes, and by other characters.

Described from many living specimens which flowered in the National Botanic Gardens. The colour of the perianth is a pale terra-cotta.

Tritonia Mathewsiana, L. Bolus (*Irideae-Ixieae*), *T. Pottsii* affinis sed foliis latioribus, magis conspicue plicatis, ramis axis florentis curvatis, floribus secundis differt.

Erecta glaberrima, 1.5 met. alta vel ultra; folia adscendentia vel fere erecta, plicata, radicalia ca. 4, caulina ca. 10, ensiformia, nervis primariis ca. 13, 35 cm. longa, 4 cm. lata; pedunculus ad 15 cm. longus, folio supremo reducto ad 6 cm. vaginatus; spica ramosa, ramis divaricatis, axi florente flexuoso, satis denso, floribus secundis, demum axi perpendicularibus; bracteae oblongae acutae, 0.3—0.5 cm. longae juniores herbaceae; bracteolae fere ad apicem coalitae, acutae, bracteis aequilongae; perianthium rubro-aurantiacum, 3—3.5 cm. longum, tubo infundibuliformi, ad 1.8 cm. longo, basi 0.15 cm., apice 0.5 cm. diam., segmentis demum patentibus, ovato-oblongis obtusis, exterioribus 1.3 cm. longis, 0.5 cm. latis, interioribus 1.5 cm. longis, 0.6 cm. latis, supremo 1.7 cm. longo, 0.7 cm. lato; stamina plus minusve arcuata, filamentis 1.3 cm. longis, antheris 0.5—0.7 cm. longis; stylus 2.3 cm. longus, ramis 0.5 cm. longis; capsula subglobosa, obtuse triangularis, 0.8 cm. longa, seminibus pluribus subtriangularibus, 0.4 cm. longis.

Transvaal: Graskop, Pilgrims' Rest, *Mrs H. M. Wood* (National Botanic Gardens, No. $\frac{542}{16}$).

Allied to *T. Pottsii*, Benth., but differs in having broader and more plicately-folded leaves, branches of the flowering-axis curved, and the flowers unilateral.

Described from living specimens which flowered at Kirstenbosch during Feb. of the years 1918—1921. Named in honour of Mr J. W. Mathews, Curator of the National Botanic Gardens.

Synnotia Metelerkampiae, L. Bolus (*Irideae-Ixieae*), *S. variegatae* affinis sed perianthii segmentis brevioribus angustioribusque, parte superiore tubi perianthii 0.5—0.7 cm. diam. differt.

Herba glaberrima, 16—25 cm. alta; cormus ovoideus, 1.6 cm. longus, 1.2 cm. diam., tunicis rigidis, prominenter nervatis, nervis reticulatis; caulis erectus, foliis equitantibus vestitus; folia producta 6—7, adscendentia linearia, obtusa, apiculata vel acuta, nervis inconspicuis, 5—8 cm. longa, 1—1.2 cm. lata; spica e basi ramosa, laxa 9—12-fl., floribus fere erectis; bracteae circumscriptione ovatae, ca. 2 cm. longae, bracteolis ultra medium coalitis, setaceo-acuminatis, bracteis fere aequilongis; perianthium atro-violaceum, segmentis inferioribus miniatis, tubo filiformi, 0.1—0.2 cm. diam., apicem versus oblique ampliato, ad 0.7 cm. diam., 4—4.5 cm. longo, segmentis exterioribus ovato-oblongis subacutis, 1.2 cm. longis, 0.4—0.6 cm. latis, interioribus subunguiculatis obtusis, marginibus obscure undulatis, supremo ovato, 1.4 cm. longo, 0.8 cm. lato, inferioribus 0.5 cm. latis; filamenta 1.2 cm. longa, antheris cum polline purpureis, 0.3—0.5 cm. longis; stylus 4.6 cm. longus, ramis spathulatis, 0.3 cm. longis; capsula cylindrica, 1.5 cm. longa, seminibus plurimis subglobosis, 0.2 cm. diam.

Cape Province: South-Western Region; Clanwilliam Div., near Eendekuil, *Mrs F. Metelerkamp* (Bolus Herbarium, No. 16039).

Allied to *S. variegata*, Sweet, but differs in having the perianth-segments shorter and narrower, and the upper part of the perianth-tube 0.5—0.7 cm. in diameter. The arrangement of colour on the perianth is also different.

Described from living specimens which flowered in Mr F. Metelerkamp's garden.

Gladiolus Blackwellii, L. Bolus (§ *Eugladiolus*) [*Irideae-Ixieae*], *G. salmoneo* affinis sed foliis crassioribus latioribusque, et perianthio roseo, tubo multo brevior differt.

Cormus depresso globosus, 2—3 cm. longus, 4—5.5 cm. diam., tunicis crebro satisque tenuiter nervosis, pallide brunneis vel interdum purpureis; caulis robustus, saepissime glaber, ad 1 met. altus, nodis 5; folia rigide adscendentia, vel superiora fere erecta, longe vaginantia, vaginis 18—30 cm. longis, laminis ensiformibus, conspicue nervosis, nervis 5—7, magis prominentibus, omnino tenuiter pilosa, 15—62 cm.

longa, 1—6 cm. lata, folio infimo vaginiformi purpurascente, ad 14 cm. longo; pedunculus 5—6 cm. longus; spica simplex vel ramosa, disticha, multiflora, ad 46 cm. longa, ramis ad 26 cm. longis; bracteae herbaceae ovato-oblongae setaceo-acuminatae, crebro nervosae, tenuiter pilosae, 1·5—4·5 cm. longae, bracteolis fere ad apicem coalitis, parte libera setaceo-acuminata, ad 0·4 cm. longa, 1—3·2 cm. longis; perianthium ad 7·5 cm. longum, tubo ad 2·5 cm. longo, inferne 0·2 cm., apice 0·7 cm. diam., segmentis ovato-oblongis obtusis, marginibus undulatis, roseis, inferioribus vittatis, vitta angustissima carminea, supremo 2 cm. lato, lateralibus 2·5, inferioribus interioribus 1·6, exteriore 2·1 cm. latis; filamenta 2 cm. longa, antheris 1·3 cm. longis; stylus 5 cm. longus, ramis 0·8 cm. longis.

Cape Province: South-Eastern Region; Tembuland, *T. E. Blackwell* (R. Marloth, 7793).

Allied to *G. salmoneus*, Baker, but differs in having thicker and broader leaves, the perianth rose-pink, and by the much shorter perianth-tube.

Described from living specimens which flowered in February in Dr R. Marloth's garden and in Mr N. S. Pillans' garden. Flowered also in the National Botanic Gardens, March 1921.

Strumaria Watermeyeri, L. Bolus (*Amaryllideae-Amarylleae*), foliis 2, hysternanthiis, basi in vagina infundibuliformi truncata haud inclusis, filamentis inter se liberis, perianthii segmentis planis distinguitur.

Bulbus ovoideus, in collum breve productus, 2·3 cm. longus, 1·6 cm. diam.; folia 2, hysternanthia linearia subacuta, basin versus quasi in petiolum angustata, apicem versus marginibusque papillata, 4·5—5·5 cm. longa, ad 1·2 cm. lata; pedunculus ca. 7-fl., floribus roseis, 9—11 cm. longus, basi 0·3, apice 0·2 cm. diam.; spatha 2-foliata, foliis oblongo-lanceolatis acuminatis, ad 2·5 cm. longis; pedicelli adscendentes vel patentes, 1·7—2·7 cm. longi; perianthii tubus brevissimus, 0·15 cm. longus, segmentis erectis, a medio vel supra recurvis, linearibus obtusis, basin versus gradatim attenuatis, 1·5 cm. longis, 0·2—0·3 cm. latis, exterioribus apice cucullatis, papillatis; stamina interiora segmentorum apicem fere attingentia, exteriora breviora, filamentis 0·6—0·8 cm. longis, antheris 0·2 cm. longis; ovarium demum globose obovoideum, loculis ca. 3-ovulatis; semina pyriformia, laete viridia, lucida, 0·7 cm. longa.

Cape Province: Upper Region; Calvinia Div., Nieuwoudtville, *E. B. Watermeyer* (National Botanic Gardens, No. $\frac{997}{16}$). Flowered two or three times at Kirstenbosch in April.

The following characteristics, viz. the two hysternanthous leaves, not enclosed in a truncate funnel-shaped tube at the base, the filaments

not united to one another and the flat, not undulate, perianth-segments, when taken together serve to distinguish this species from all the others in the genus.

Named after the sender, Mr E. B. Watermeyer, to whom the Gardens are indebted for many interesting plants.

Nerine Frithii, L. Bolus (*Amaryllideae-Amarylleae*), *N. appendiculatae* affinis, sed foliis subfiliformibus, pedicellis glabris, floribus minoribus paucioribusque distinguitur.

Omnino glabra; bulbis ovoideo-globosis, 2 cm. longis, 1.7 cm. diam.; folia synanthia, saepissime 2, subflaccida, subfiliformia, supra canaliculata, ad 15 cm. longa, 0.1—0.15 cm. lata; pedunculus teretis, ad 20 cm. longus; spathae folia oblonga, longe attenuata, 2.5—3 cm. longae; bracteae capillaceae membranaceae, 1—1.5 cm. longae; flores 5—7, pedicellis ad 3 cm. longis; perianthium roseum, segmentis patentibus, deinde recurvis, linearibus acutis, marginibus undulatis, 1.5 cm. longis, 0.4 cm. latis; stamina declinata, filamentis brevioribus 0.35, longioribus 0.6 cm. longis, appendicibus oblongis, 0.3 cm. longis, parte superiore laceratis, lobis duobus ceteros multo excedentibus; antherae purpureae, ad 0.4 cm. longae; ovarium obovatum, loculis 2-ovulatis; capsula globosa, 0.8 cm. diam.

Cape Province: Kalahari Region; Griqualand West, without precise locality, fl. April, *M. Wilman* (Bolus Herbarium, No. 13934); Kimberley Div., Riverton, *M. Wilman* (National Botanic Gardens, No. $\frac{1362}{14}$); Orange Free State, Hoopstadt, fl. March, *Mrs D. M. Robertson* (Bolus Herbarium, No. 13976). Without precise locality, *Frith* (National Botanic Gardens, No. $\frac{2298}{14}$).

Allied to *N. appendiculata*, Baker, but may be distinguished by the almost filiform leaves, glabrous pedicels, smaller flowers, with fewer to each umbel.

Described from living specimens which have flowered freely at Kirstenbosch for several years from plants sent by Miss Wilman and Mr Frith.

Cyrtanthus Guthrieae, L. Bolus (*Amaryllideae-Amarylleae*), ab omnibus ceteris speciebus generis floribus sessilibus, perianthii segmentis late patentibus, tubo aequilongis, tubo pro parte magis graciliore differt.

Glaberrimus, bulbo globoso-ovoideo, 3 cm. longo, 2.5 cm. diam.; folia hysternanthia, haud visa; pedunculus curvatus, ca. 11 cm. longus, 1-, rarissime 2-fl.; spatha 2-foliata, foliis lanceolatis, longe attenuatis, 3.3 cm. longis; perianthium laete rubrum, tubo curvato, parte inferiore cylindrica, superiore gradatim ampliata, 4.3 cm. longo, basi 0.4 cm., apice 1.1 cm. diam., segmentis obovato-oblongis acutis, inter se aequalibus, 4.3 cm. longis, 1.9 cm. latis; stamina 3—3.5 cm. longa, antheris

0.3—0.5 cm. longis; capsula (immatura) cylindrica, 1.5 cm. longa, 0.7 cm. diam., seminibus atro-brunneis, 0.7 cm. longis.

Cape Province: South-Western Region; Bredasdorp, fl. April, communicated by *Miss L. Guthrie* (Bolus Herbarium, No. 16907).

A very distinct species, differing from all the rest in having sessile flowers, widely spreading perianth-segments which are as long as the tube, while the tube itself is proportionately much more slender. The spread of the perianth and the relatively long tube are more characteristic of *Vallota* than *Cyrtanthus*, but there is no doubt the two genera are very closely related, and *C. Guthrieae* may almost be considered a connecting link. In *Vallota* the filaments are often adnate to the perianth-segments. It is interesting to note that the hybrid between *C. sanguineus* and *Vallota* has flowered at Kirstenbosch.

Described from dried specimens and paintings of the living plant made by *Miss L. Guthrie*, after whom the species is named. The colour is a bright red with a "golden glitter."

Agapanthus pendulus, L. Bolus (*Liliaceae-Allieae*), *A. Walshii* affinis, sed foliis deciduis herbaceis latioribus, pedicellis longioribus, floribus saepius minoribus, perianthii segmentis haud vel vix patentibus, staminibus haud declinatis differt.

Folia linearia, obtusa vel subacuta, ad 36 cm. longa, 3.5 cm. lata; pedunculus teretis multiflorus, floribus pendulis, ad 46 cm. altus; spatha non visa; pedicelli adscendentes, apicem versus decurvati, 5 cm. longi; perianthium leviter curvatum, atro-purpureum extus, pallidius intus, 2.5—3.4 cm. longus, basi 0.5 cm., apice 1.4 cm. diam., segmentis ad 1.4 cm. longis, exterioribus haud patentibus, 0.5 cm. latis, interioribus parum latioribus, leviter patentibus, obtusissimis, obscure undulatis; filamenta stricta, uno perianthium parum excedente, uno perianthio brevior, ceteris idaequantibus antherae; oblongae, ca. 0.2 cm. longae, polline viridi; ovarium cylindricum, ca. 1 cm. longum, stylo fere 2 cm. longo; capsula acute 3-angularis, 2.1 cm. longa vel ultra, seminibus apice ampliate alatis.

Transvaal: Lydenburg, *A. S. Barnett* (National Botanic Gardens, No. ¹⁰⁵⁶/₁₆).

Allied to *A. Walshii*, mihi, in having the tube of the perianth longer than the segments, but is distinguished by the deciduous herbaceous broader leaves, the longer pedicels, usually much smaller flowers, the perianth-segments not or scarcely spreading, and the straight filaments.

Described from living specimens which flowered at Kirstenbosch, Feb. 1921. (Plate III, B.)

Restio MacOwani, Pillans (*Restiaceae-Restioideae*), *R. folioso* affinis, sed caulibus simplicibus, inflorescentia brevior, spiculis minoribus differt.

Stems scattered, simple, straight, rigid at the base, slender in the upper parts, terete, smooth, 6—10 dm. high; leaf-sheaths closely convolute, oblong-lanceolate, acuminate, subulate-aristate, smooth, coriaceous, membranous and lacerate at the upper margins, purplish, 1.5—2.5 cm. long; male spikelets numerous, in paniced cymes; cymes rather lax, more or less secund and pendulous, in pairs or several, rarely solitary, at each of the upper nodes, mostly 3.5—5 cm. long, together forming a plume-like inflorescence 1—2 dm. long; spikelets oblong-ovate, obtuse, 6—8-flowered, about 5 mm. long; spathes ovate, acuminate, mucronate, with the midrib prominent on the apical half, coriaceous in the lower half, white-membranous in the upper, 2—3 mm. long; barren bracts 1—2; fertile bracts loosely convolute, ovate, acute or obtuse, mucronulate, membranous at the margins, 3—4 mm. long; flowers subsessile, ovate, obtuse, 2 mm. long; outer perianth-segments linear-lanceolate, acute, cartilaginous, glabrous, reddish; the lateral obtusely keeled; the anterior dorsally rounded; inner segments oblong-lanceolate, obtuse, membranous, reddish, slightly shorter than the outer; female spikelets many, in spicate cymes, lanceolate-ovate, acute, 1-flowered, 6—8 mm. long, forming a narrow inflorescence 6—10 cm. long; spathes convolute at the base, spreading in the upper part, ovate, acuminate, coriaceous in the lower part, white-membranous and lacerate in the upper, filiform-aristate, 7—10 mm. long; barren bracts 3—4, closely convolute, ovate, acute, mucronate, cartilaginous, with white-membranous margins, 3—4 mm. long; the fertile bract similar, but usually smaller; flowers subsessile, lanceolate, acute, exerted beyond the bracts, 4.5—6 mm. long; outer perianth-segments alike, oblong, acute, dorsally rounded, cartilaginous, glabrous, reddish; inner segments ovate-oblong, acute, cartilaginous, slightly shorter than the outer; ovary 3-celled, obtusely 3-lobed, ovate or globose; styles 3, distinct, densely plumose to the base; capsule 3-seeded; seeds smooth.

Cape Province: South-Western Region; Caledon Div., Koude River, Schlechter, 10461, ♂! 10462, ♀! Uniondale Div., Uniondale, F. Paterson, 3009, ♂! Uniondale Road, Tugwell in Herb. Bolus, 14288, ♂! F. Paterson, 3013, ♀! Steytlerville, F. Paterson, 19, ♂! South-Eastern Region; Grahamstown Div., mountains near Grahamstown, MacOwan, 1361, ♂! Grahamstown, M. Daly and M. Sole, 36, ♂! G. White, 34, ♂!

This species is chiefly distinguished from its ally, *R. foliosus*, N.E.Br., in having simple stems, shorter inflorescence and smaller spikelets.

The more or less secund and plume-like male inflorescence might well be mistaken for that of a *Thamnochortus*, but the spikelets are smaller than any known species in that genus.

Restio tabularis, Pillans, *R. compresso* affinis, sed caulibus teretibus brevioribusque, spiculis minoribus, ovario abortione 1-loculari distinguitur.

Stems scattered, erect, slender, terete, sparingly branched from near the base to the summit, obscurely tubercled and wrinkled on the lower parts, nearly smooth on the upper, with yellowish spots, 3—5 dm. high; leaf-sheaths closely convolute, except at the ramifications, oblong, tapered to an acute apex, with a straight subulate mucro, coriaceous, nervose-striate, membranous at the margins, red-brown, yellow-speckled, mostly 1.5 cm. long; male spikelets solitary, rarely in pairs, erect, linear-cylindric, acuminate, ultimately oblong, many-flowered, without barren bracts, 2—2.5 cm. long; spathes like the upper leaf-sheaths; bracts loosely convolute, linear-oblong, acuminate, with a slender mucro, coriaceous, nervose-striate, narrow-membranous along the margins, pale reddish brown, 1—1.3 cm. long; flowers on short stipes, linear-oblong, obtuse, 3.5 mm. long; outer perianth-segments cartilaginous, light brown; the lateral navicular, linear-oblong, acute, slightly villous on the upper part of the carina, the left segment larger than the right; anterior segment lanceolate, obtuse, dorsally rounded, glabrous; inner segments linear-oblong, obtuse white-hyaline, very thin; about equaling the outer; female spikelets solitary, rarely in pairs, erect, linear-cylindric, acute, becoming linear-oblong, truncate, many-flowered, with one barren bract, 2—2.5 cm. long; spathes as in the male, about 1.3 cm. long; bracts as in the male, but slightly larger; flowers on short stipes, obliquely oblong, obtuse, 4 mm. long; outer perianth-segments cartilaginous, scabrid on the outside, light brown; the left segment navicular, linear-oblong, acute, villous-carinate; the right segment linear-oblong, acute, obtusely keeled and villous on the upper half, smaller than the left; anterior segment linear-oblong, obtuse, dorsally rounded, glabrous; inner segments oblong-lanceolate, obtuse, membranous, brownish, slightly shorter than the outer; ovary by abortion 1-celled, narrow-ovate; styles 3, free, adjacent, very slender.

Cape Province: South-Western Region; Cape Div., lower plateau on Table Mountain, Pillans, 3904, ♂ and ♀!

Allied to *R. compressus*, Rottb., but differs in having terete and shorter stems, smaller spikelets and the ovary 1-celled by abortion.

Restio similis, Pillans, *R. Browniano* affinis, sed spiculis majoribus, ovario 3-loculari, stylis adjectis differt.

Stems caespitose at the base, erect, slender, terete, sparingly branched from the base upwards, slightly rough, with raised whitish spots on a somewhat iridescent brownish ground, 25—30 cm. high, less than 1 mm. in diam. at the base; leaf-sheaths closely convolute except at the ramifications, oblong, obtuse, with a stout erect-spreading mucro,

coriaceous, nervose-striate, scarcely membranous on the upper margin, red-brown, mostly 8—10 mm. long; male spikelets 2—3, occasionally solitary, in spicate cymes, oblong to ovate-oblong, shortly tapered at the base, obtuse, many-flowered, 8—12 mm. long; spathes closely convolute, oblong, obtuse, subulate-mucronate, coriaceous, brown-membranous along the side margins, 4—6 mm. long; bracts closely enveloping the flowers, ovate, obtuse, mucronulate, coriaceous, smooth, straw-colour except at the chestnut-brown apex, 4—5 mm. long; flowers on short reddish stipes, oblong-oblancheolate, obtuse, 3.5—4 mm. long; outer perianth-segments oblong-lanceolate, obtuse, cartilaginous; the lateral navicular, villous-carinate; the anterior dorsally rounded, glabrous; inner segments lanceolate, truncate, hyaline; female spikelets resembling those of the male plant, but 1-flowered and slightly smaller; spathes as in the male, but 3—4 mm. long; bracts closely convolute, oblong-ovate, obtuse, mucronulate, coriaceous, smooth, straw-colour except at the chestnut-brown apex, about 3.5 mm. long; flowers on short red stipes, ovate 3.5 mm. long; perianth-segments oblong-lanceolate, obtuse or subacute, cartilaginous, subequal; the outer lateral segments navicular, villous on the upper half of the carina; the other segments dorsally rounded, glabrous; ovary 3-celled, ovate; styles 3, adjacent, free; capsule 2-celled; seeds cylindrical, studded with white tubercles.

Cape Province: South-Western Region; Caledon Div., Houw Hoek, Schlechter, 5483, ♀! 7382, ♂!

Allied to *R. Brownianus*, Pillans (*Hypolaena Browniana*, Mast.), but differs in having larger spikelets, the ovary 3-celled and the styles adjacent.

Restio Marlothii, Pillans, *R. fraterno* accedit, sed caulibus tuberculatis, perianthii segmentis florum ♀ quaternis differt.

Stems caespitose at the base, erect, sparingly branched from the middle upwards, rarely simple, terete, rather slender, firm, rough with crowded tubercles, yellowish green, 30—50 cm. high, 1 mm. in diam. on the lower portion; leaf-sheaths closely convolute, oblong, acute, tapered into a straight subulate awn, coriaceous, nervose-striate, deeply white-membranous from the upper margin to near the apex of the awn, red-brown, about 1 cm. long; female spikelets solitary, oblong to ovate-oblong, obtuse, 3—5-flowered, 10—12 mm. long; spathes tightly convolute, oblong, with a cartilaginous wing along each side, otherwise like the upper sheaths; bracts similar to the spathes, but paler, 5—6 mm. long; flowers on woolly stipes, oblong or broadly wedge-shaped, 4—5 mm. long; perianth-segments 4, deltoid-lanceolate, acute, cartilaginous, equal; the lateral villous-carinate; the anterior dorsally

rounded, glabrous; the posterior segment similar to the anterior; ovary 2-celled, broadly ovate, compressed; styles 2, united to shortly above the base, long, slender in the upper parts; capsule 2-seeded.

Cape Province: Karroo Region; Laingsburg Div., on the Witteberg near Matjesfontein, Marloth, 3146, ♀!

Allied to *R. fraternus*, Kunth, from which it chiefly differs by tubercled stems and the female flowers having 4 perianth-segments.

Restio aridus, Pillans, *R. ferruginoso* affinis, sed caulibus brevioribus, vaginis foliorum arcuatis convolutis, spiculis ♂ minoribus, spiculis ♀ paucioribus differt.

Stems caespitose at the base, erect, slender, rigid, terete, sparingly branched from the base upwards or simple, with filiform branchlets, finely tubercled, 3—4 dm. high, about 1 mm. in diam. below the middle; leaf-sheaths closely convolute, oblong, acute, subulate-aristate, coriaceous, membranous at the margins, smooth, red-brown, often with exserted woolly scales in the axils, 6—8 mm. long; male spikelets numerous, in sparsely-branched spicate cymes, cylindric-oblong, acute, many-flowered, 4—5 mm. long; spathes closely convolute, oblong, obtuse, subulate-mucronate, coriaceous, narrow-membranous at the margins, red-brown, about 3 mm. long; bracts closely imbricate, spathe-like, but thinner, 2 mm. long; flowers shortly stipitate, lanceolate, acute, equalling the bracts; perianth-segments linear-oblong, acute, membranous, subequal; the outer lateral villous-carinate; the anterior slightly villous on the midrib; female spikelets 1—3, in lax spicate cymes, narrow-cylindric, acute, tapered at the base, ovoid when in fruit, 4—5-flowered, 7—8 mm. long; spathes closely convolute, oblong, obtuse, subulate-aristate, coriaceous, smooth, red-brown, 3—4 mm. long; bracts closely imbricate, ovate-oblong, obtuse, subulate-mucronate, coriaceous, smooth, membranous at the margins, 3 mm. long; flowers shortly stipitate, lanceolate, acute, about equalling the bracts; perianth-segments membranous; the outer oblong-lanceolate, acute; the lateral villous-carinate; the anterior dorsally rounded, slightly villous on the midrib; the inner segments oblong-ovate, acute, shorter than the outer; ovary 2-celled, subglobose, compressed; styles 2, united to shortly above the base; capsule 2- or, by abortion, 1-seeded; seeds oblong-ovate, subtrigonal, smooth, shiny, spotted purple-brown.

Cape Province: Karroo Region; Worcester Div., hills at Touws River, Bolus, 7456, ♀! 9210, ♂ and ♀!. Marloth, 3157, ♂ and ♀!.

Allied to *R. ferruginosus*, Link, but differs with shorter stems, closely convolute leaf-sheaths, smaller male spikelets and fewer female spikelets.

Restio humilis, Pillans, *R. trifloro* accedit, sed rhizomatibus reptantibus, caulibus levibus, spiculis paucioribus distinguitur.

Stems of female plants erect from a creeping rhizome, slender, simple or rarely sparingly branched at the base, terete, smooth, buff with minute purple specks, 2—3 dm. high, about 1 mm. in diam. at the base; leaf-sheaths closely convolute, oblong, obtuse, subulate-mucronate, coriaceous, with narrow-membranous margins, buff, densely purple-speckled, 8—12 mm. long; spikelets 2—6, sometimes solitary, in linear spicate cymes, linear-lanceolate, acute, 4—6-flowered, 6—8 mm. long; spathes tightly convolute, oblong, obtuse, mucronate, coriaceous, with narrow-membranous margins, marked like the sheaths, 3—5 mm. long; bracts closely convolute, oblong, obtuse and pale-membranous at the upper margin, mucronulate, cartilaginous 3—3.5 mm. long; flowers shortly stipitate, lanceolate, acute, 3 mm. long; outer lateral perianth-segments lanceolate, acute, villous-carinate, cartilaginous; the anterior segment lanceolate, obtuse, dorsally rounded, cartilaginous, glabrous, slightly shorter than the lateral; inner segments oblong-lanceolate, obtuse, membranous, distinctly shorter than the outer; ovary 2-celled, ovoid, tapered above into a minutely puberulous stylopodium; styles 2, slender, united to shortly above the base; capsule 2-seeded, broadly ovoid.

Cape Province: South-Western Region; Caledon Div., Houw Hoek, Schlechter, 7416, ♀! Ceres Div., near Klein Vley, Skurfdebergen, Koude Bokkeveld, Schlechter, 10218, ♀!

Allied to *R. triflorus*, Rottb., but differs in having creeping rhizomes, smooth stems and fewer spikelets.

- Restio* Brownianus, Pillans, comb. nov. = *Hypolaena?* *virgata*, Mast., Journ. Linn. Soc. x, 268 (1868). *H. Browniana*, Mast., Fl. Cap. VII, 132 (1897). *H. subtilis*, Mast., Engl. Bot. Jahrb. XXIX, Beibl. 66, p. 15 (1900). ✓
- Restio* conspicuus, Pillans, comb. nov. = *Hypolaena?* *conspicua*, Mast., Engl. Bot. Jahrb. XXIX, Beibl. 66, p. 15 (1900). ✓
- Restio* Dodii, Pillans, comb. nov. = *Hypolaena* *membranacea*, Mast., Engl. Bot. Jahrb. XXIX, Beibl. 66, p. 14 (1900). ✓
- Restio* Schlechteri, Pillans, comb. nov. = *Hypolaena* *Schlechteri*, Mast., Engl. Bot. Jahrb. XXIX, Beibl. 66, p. 15 (1900). ✓
- Restio* cymosus, Pillans, comb. nov. = *Leptocarpus* *cymosus*, Mast., Engl. Bot. Jahrb. XXIX, Beibl. 66, p. 10 (1900).
- Restio* brachiatus, Pillans, comb. nov. = *Leptocarpus* *brachiatus*, Mast., Engl. Bot. Jahrb. XXIX, Beibl. 66, p. 9 (1900). ✓

NOTES ON *ACMADENIA*, B. AND W., WITH A DESCRIPTION OF ONE NEW SPECIES AND ONE NEW VARIETY

BY R. A. DUMMER.

Acmadenia barosmoides, Dummer, in Journ. Bot. (1912), 221. This very rare plant was originally described by me from material at the British Museum, collected by Niven, one of the earlier botanical collectors, in Alpine stony places in Lange Kloof (Uniondale Div.).

More recently Dr Marloth has collected this plant again but unfortunately the three specimens in his Herbarium have no particulars as to locality and date of collection. These specimens do not quite agree with my original description in that the flowers are in pairs instead of being solitary, and the leaves more markedly glandular-denticulate, but I have no hesitation in assigning them to this species. As far as I am aware these specimens comprise the only dried material in S.A. Herbaria.

A. Marlothii, sp. nov. *A. barosmoidi* affinis, sed foliis late ovatis vel late ellipticis, glabris, marginibus haud incrassatis, floribus staminodiis praeditis, filamentis fertilibus pilosulatis, ceterisque distinguitur.

Fruticulus multiramulus et dense foliosus, ramis ascendentibus brevibus; ramuli conferti breves subangulati albo-pubescentes, pallide brunnei, subimbricato-foliosi. Folia perbreviter petiolata ascendunt subimbricata, late ovata vel late elliptica, obtusa, 3—4 mm. longa, 2—4 mm. lata, planiuscula, supra nitentia, pallide viridia, subtus pallidiora, obscure 5—16-glanduloso-punctata, ecostata, utrinque mox glabra, coriacea, margine vix incrassata, glanduloso-crenulata, petiolo complanato puberulo; flores solitares carnei (in sicco), perbreviter pedicellati, ramulos breves terminantes; calyx 2.5 mm. longus, transparente scariosus, segmentis deltoideis cuspidato-acuminatis, dorso carinatis, marginibus pilosulis; petala breviter unguiculata, 6—7 mm. longa, 3 mm. lata, elliptica obtusiuscula ebarbata glabra, dorso glandularum seriebus binis instructa; stamina 4—5 mm. longa, filamentis inferne pilosulis; staminodia oblonga, medio paullulo inflata, circa 3 mm. longa, 0.5—0.7 mm. lata, glabra, apice glanduloso-rotundata; stylus crasse filiformis, inferne pilosulus, stigmato truncato.

Cape Province: South-Western Region; Matroosberg, 6400 ft., R. Marloth, 7948.

This species is obviously allied to *A. barosmoides*, mihi, from which, however, it is at once distinguished by its smaller, broadly ovate or broadly elliptic glabrous leaves, not thickened at the margins, and with crenulate dentition, by the smaller flowers with dorsal glands on their petals, by the presence of staminodia, the pilosulate filaments of the fertile stamens, and the sparingly pilose style. The leaves recall those of *Agathosma decora*, mihi, also from the Matroosberg.

Acmadenia macradenia, comb. nov.

Sonder, in his original description of *Adenandra macradenia* fails to describe the petals and essential organs of this plant. In 1895 Bolus gathered a twig with two flowers at Piquetberg, which, though not wholly in agreement with the species, is sufficiently close, to regard as a variety of this long-lost plant, and which, on dissection of a flower, shows that they are devoid of staminodes, and have only five stamens, which therefore assigns it to *Acmadenia*.

A. macradenia var. *borealis*, var. nov.

Fruticulus pusillus?, ramulis brevissimis pubescentibus imbricato-foliosis. Folia late elliptica vel late obovata, apice rotundata, 5—8 mm. longa, 3.5—4.5 mm. lata, crasse coriacea, utrinque glabra, pallide viridia, complanata, haud convexa, dorso conspicue albido elevato-glandulosa, costata, margine incrassata, primo pilosula, apicem versus glanduloso-denticulata. Flores solitaires, albidus (sicco), pedicellis 2—3 mm. longis, albopilosis, ebracteolatis? Calyx 5—6 mm. longus, inferne albo-pilosus, segmentis longe-triangularibus, obtusiusculis, dorso roseo-purpureis, nitidis, carinato-costatis, costis primo ciliatis, marginibus creberrime pilosis, apicem versus glanduloso-denticulatis. Petala unguiculata, 1 cm. longa, limbo orbiculari, 7—8 mm. lato, dorso apice paullulo barbata, unguibus glabris. Stamina (5) 2.3 mm. longa, glabra. Pistillum ignotum.

Cape Province: South-Western Region; Piquetberg Div., Piquetberg, Oct. 1895, *H. Bolus*, 8420!

Differs from the type (*Adenandra macradenia*, Sond. of which Ecklon and Zeyher types, labelled *A. coriacea*, E. and Z. are in the S.A. Museum, Cape Town), by its dwarfer habit (if the specimen quoted (8420) is representative of a dwarf plant?), by its flat and not concave leaves, relatively broader and more coriaceous, and with a more prominent dorsal midrib.

A. teretifolia, comb. nov. *Diosma teretifolia*, Link.; Sonder, in *Flora Cap.* 1, 376, 1860. As Dr E. P. Phillips has pointed out (in MSS.), this plant is to be referred to *Acmadenia*, hence this new combination is proposed. Phillips states that the flowers are pink, though they dry a white. The following are more recent records not quoted in the *Flora*.

Cape Province: South-Western Region; Clanwilliam Div., *Leipoldt*, 651! in Bolus Herb. and S.A. Mus., near Wupperthal, Oct. 1897, *A. Bodkin* (Herb. Bolus, No. 8957!). Ceres Div., Tafelberg, Koude Bokkefeld, near Ceres, 6200 ft., Jan. 1897, *Dr R. Schlechter*, 10098! in Herb. Bolus, and S.A. Mus. Matroosberg, near Laaken Vlei, 7000 ft., Jan. 1917, *Dr E. P. Phillips*, 1968! (S.A. Mus. Herb. No. 11768). On the Skurfdebergen, Gydouw, near Ceres, Dec. 1891, *H. Bolus*, 7576! Matroosberg, 7400 ft., Jan. 1897, *Alfred Bolus* (Herb. Bolus, No. 6360!).
Var. *glabrata*, *Diosma teretifolia*, Link. var. *glabrata*; *Acmadenia obtusata*, E. and Z.

This variety was originally collected in the Winterhoeksberg by Ecklon and Zeyher, and is reputed to differ from the type only in the twigs and leaves being glabrous or nearly so. If such is the case, then Dr Marloth's collections from the Matroosberg, about 6500 ft., in Jan. 1897, No. 2343 (= 1995) in his Herbarium and Bolus Herb. are referred to this variety. It is upon this that Schlechter based his *Acmadenia c—a* (an unpublished name). Marloth describes the bush as stunted, about $\frac{1}{2}$ met. high, and growing on rocks. *A. Bolus*, 3968, from the same mountain at 5000 ft. elevation, and *A. Bolus*, 4188, from the Great Winterhoeksberg, and also referred to this variety. Of the latter specimens the collector states that the flowers are purple, and the height of the bush 4—5 ft.

THE TYSON COLLECTION OF MARINE ALGAE

BY ELLEN MARION DELF, D.Sc. (LOND.), F.L.S.

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AND

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THERE are two collections of marine Algae in the Bolus Herbarium, that of Dr H. Becker including specimens from all over the world and that of the late Mr W. Tyson, acquired in 1913, composed almost entirely of specimens from the shores of the Cape Province and Natal, chiefly from Algoa Bay, the Kowie, the Kei mouth, and the Cape Peninsula.

The sheets of the Tyson collection have now been arranged by us in accordance with the classification of Engler and Prantl⁽⁵⁾ (Nat. Pflanz. Fam. 1897) and a list of specimens drawn up with a view to facilitating the use of the collection by future workers. Incorporated in the lists are such personal observations as we have been able to make on the herbarium and also on fresh material during the course of the work. Both of us have made observations at intervals on the seashore from April to December of this year (1920), but in compiling the lists one of us undertook the Green and Brown Algae (M. R. Michell) and the other (E. M. Delf) undertook only the Red Seaweeds.

As this is the first list of the kind to appear in a South African Journal, it may not be out of place to give some account of the present position of our knowledge of South African seaweeds. It is hoped that the information thus brought together though meagre, may serve as a basis for future work.

A short historical summary of the development of our knowledge of S. African seaweeds is given by Miss Barton⁽¹⁾ (Journ. Bot. xxxi, pp. 53, 81, 111, 139, 171, 202, 1890) from which the following facts are taken:

"The earliest preserved Alga from the Cape is a specimen of *Amphiroa* which is too much broken to determine the species; it was collected by Dr Hermann in 1672, and is preserved in the British Museum. The next collector appears to have been John Staremburgh who at some date prior to 1703 sent some dried Algae to Petiver and these are also preserved in the British Museum, where I have seen specimens of *Macrocystis pyrifera*, J. Ag., an *Iridea*, and

an Alga which is probably *Pachymenia carnosa*, J. Ag. In later times we have collections made by Harvey containing a large proportion of the total number of species recorded from the Cape; by Pappe on whose specimens Kützing founded many of his Cape species. A large collection of Algae was made in 1889—1890 by Mr L. Boodle and presented to the British Museum;... An unnamed collection of Corallineae from the Cape still remains in the British Museum Herbarium collected by Bowerbank, Mr Boodle and others; there are also unnamed specimens of Chaetomorpha and Cladophora." From these various sources Miss Barton compiled the list already mentioned. Other articles have appeared from time to time since the publication of the original list, adding further details of genera, or further records of Algae as additions to the original list. These are noted in the present list as far as possible.

The Tyson collection includes a considerable variety of forms in which the preponderance of red seaweeds is at once noticeable. The same impression is made on even a cursory examination of the flora of the coast, at least round about the Cape Peninsula, which is the only region which we have ourselves observed.

It is well known that the temperature of the waters on the east and west sides of the coast of S. Africa is very different. According to Miss Barton, "On the East there is a strong warm current flowing southward from the Indian Ocean, bringing with it the tropical and subtropical forms (i.e. of Algae) to Natal and even to Cape Agulhas; while another branch of the same current flows direct from Mauritius, where the Algae are...very similar to those at the Cape, though the two places are in such different latitudes. On the west coast...there is a cold current which comes up from the south,...and this has naturally a marked effect on the Algae all up this coast. Indeed,...the genus *Laminaria* is recorded from Walfisch Bay, within the tropics, the only place in the world, so far as I know, where this is known to occur." A similar difference is found between the waters on the two sides of the Cape Peninsula with which we are here more especially concerned, and is reflected to some extent in the distributions recorded in the following lists. Other factors, however, must also play their part in determining the distributions of the different forms, and one of these is probably the formation of the foreshore, which has rocks mainly of sandstone on the eastern side (especially in False Bay) and often of granite on the colder western side. The sandstone offers a rougher surface and is more easily eroded by the waves making many deep pools and clefts in which the smaller forms can find shelter. The granite, however, affords but little assistance to the hapterons of marine plants, and in many places are bare of covering, in others only partly covered with *Porphyra* which may be found even in exposed places, impossible for any other Algae. The slate which adjoins the granite at Sea Point appears to be also a better substratum for Algae than is the granite. The Algae of the west coast are,

however, less accessible, and have not been worked sufficiently to make a fair comparison of the east and west coast at present possible.

In the following lists, the distributions first recorded are the localities mentioned on the herbarium sheets. In brackets are added any other localities mentioned by Miss Barton in her papers of 1893 (or in subsequent papers when specified), and finally any additional localities observed by ourselves.

CYANOPHYCEAE.

1. CHROOCOCCACEAE.

Note. We have found a member of this family (probably a species of *Aphanocapsa*) on granite rocks at Sea Point.

2. CHAMAESIPHONACEAE.

Note. Tyson has no representative of this family in his collection. *Dermocarpa prasina*, Born. is given by Miss Barton(1) as occurring on *Rhizoclonium* at Knysna and on *Cladophora rupestris* at the Cape.

3. OSCILLATORIACEAE.

10. *Lyngbya majuscula*, Harv.

No locality given. We have found this species at Kalk Bay and Sea Point. Miss Barton(2) records it from the mouth of the Kei.

Note. In addition to *L. majuscula* the following species have been recorded by Miss Barton(1, 2): *L. semiplena*, J. Ag. from Sea Point, and *L. aestuarii*, Liebman, from the Cape. Besides these we have found at Glencairn a species, golden brown in colour and which appears to be near to *L. ferruginea*, Ag.

5. SCYTONEMATACEAE.

2. *Scytonema* sp. (provisionally placed as *Scytonema*).

Sea Point, Kalk Bay, Glencairn.

Note. This alga was not represented in Tyson's collection, but has been added to it by us. It is very abundant in the localities mentioned in rock pools near the high tide level. The plants, except in the very young stages, are brownish in colour.

7. RIVULARIACEAE.

4. *Calothrix confervoides*, Dill. (on *Chaetomorpha*).

Cape Morgan.

Note. *C. crustacea*, J. Ag. is recorded from Kalk Bay (Barton(1)) and *C. aeruginea*, Thur. also from Kalk Bay (Barton(2)).

CHLOROPHYCEAE.

7. ULVACEAE.

2. *Ulva lactuca*, L.

Three Anchor Bay, Cape Morgan.

(Robben Island, Kalk Bay, Knysna, Port Elizabeth, Port Natal.
Barton(1).)

U. fasciata, Del.

Kei mouth, Cape Morgan.

(Cape Point, Kalk Bay. Barton(1).)

U. uncialis, Suhr.

Table Bay.

(Robben Island, Cape Agulhas. Barton(1).)

Note. Miss Barton(1) recognises a variety of *U. lactuca*, viz. *U. lactuca* var. *rigida*. Amongst Tyson's specimens of this species at least two distinct forms may be recognized. One has a dark green frond of a somewhat leathery texture, and judging from Harvey's figure and description(6) is his *U. latissima*, Linn. Possibly this is Miss Barton's *U. lactuca* var. *rigida*. The other form is much more delicate in texture and is a pale yellowish green.

3. *Letterstedtia insignis*, Aresch.

Kowie.

(Port Natal, Port Elizabeth, Port Alfred. Barton(1, 2).)

Note. In one of our Kalk Bay collections there was a small piece of a plant which was obviously a *Letterstedtia*. We have not been able to determine the species. Possibly it is a new one as there is no record of any *Letterstedtia* on the Cape Peninsula.

4. *Enteromorpha compressa*, Kütz.

Table Bay, Cape Morgan.

(Sea Point, Knysna. Barton(1).)

E. intestinalis, Link.

Cape Morgan.

(Cape Agulhas, Cape. Barton(1).)

E. rhacodes, Holmes.

Kowie.

E. sp. (very near *E. percursa*; (Ag.) Harv., if not a rather coarse form of that species.)

Cape Morgan.

Note. In addition to the above, Miss Barton(1) has records of the following species: *E. flexuosa*, J. Ag., Cape; *E. bulbosa*, Kütz., Robben Island, Table Bay, Sea Point, Cape Point, Kalk Bay, Knysna; *E. linza*, J. Ag., Cape; *E. clathrata*, Roth., mouth of the Olifants River, Algoa Bay. A sheet containing a young specimen of *E. rhacodes* shows a second species mixed up with it. This species is a slender branched one and is probably *E. clathrata*. One sheet in the collection has two distinct specimens on it. The top one is a large flat thallus which on sectioning shows itself not to be

tubular but rather like an *Ulva* in structure. The other specimen on the sheet is *E. compressa*.

We have made the following observations: *E. compressa* is by far the most common species of *Enteromorpha* on the Cape Peninsula, and is almost universally present. In one pool at Kalk Bay we found *E. compressa* and *Bryopsis setacea* growing together. On examination it was seen that the *Enteromorpha* established itself when young on the *Bryopsis*, gradually killing off the latter, though in nearly all cases we were able to find the original *Bryopsis* plant on which the *Enteromorpha* had first obtained its footing.

We have found *E. percursa* at Three Anchor Bay and Glencairn; *E. intestinalis* at Kalk Bay, and *E. linza* at Sea Point.

14. CLADOPHORACEAE.

Note. Miss Barton(2) records *Urospora penicilliformis*, Aresch. growing on *Chaetangium saccatum* at Kalk Bay.

2. *Chaetomorpha clavata* (Ag.) Kütz.

Table Bay, Camps Bay, Sea Point, Port Nolloth.

(False Bay to Algoa Bay, Cape Point. Barton(1).)

C. natalensis, Harv.

Cape Morgan, British Kaffraria.

C. crassa, Kütz.

Cape Morgan, Kei mouth.

Note. Miss Barton(1) records the following species in addition to the above: *C. linum*, Kütz., Port Natal; *C. aerea*, Kütz., Kalk Bay.

We have confirmed the presence of *C. aerea* at Kalk Bay, and have found *C. littorea* in pools on granite at Sea Point.

Note. There are no specimens of *Rhizoclonium* in Tyson's collection. Miss Barton(1), however, records three species, viz. *R. riparium*, Harv., Knysna; *R. arenosum*, Kütz., Cape; and *R. tortuosum*, Kütz., Knysna.

4. *Cladophora Eckloni* (Suhr), Kütz.

Walfisch Bay, Table Bay, Sea Point.

(Robben Island, Cape Agulhas. Barton(1).)

C. hospita, (Mert.) Kütz.

Table Bay, Robben Island, Sea Point.

(Green Point, Cape Point, Cape Agulhas, Knysna. Barton(1).)

C. catenifera, Kütz.

Table Bay, Kowie, Cape Morgan, Green Point.

(Kalk Bay, Algoa Bay, Port Alfred. Barton (1, 2).)

C. flagelliformis, (Suhr.) Kütz.

Table Bay, Sea Point.

(Olifants River to Algoa Bay, Robben Island, Kalk Bay, Cape Point, Knysna. Barton(1).)

C. nuda, Kütz.

Green Point.

(Cape Agulhas. Barton(1).)

C. sp.

Cape Morgan.

Note. Miss Barton(1) records the following additional species: *C. mediterranea*, Kütz., Cape Agulhas; *C. spinulosa*, Kütz., Cape Agulhas; *C. glomerata*, Kütz., Port Natal; *C. afra*, Kütz., Knysna; *C. rupestris*, Kütz., Cape; *C. trichotoma*, Kütz. (doubtful record), between Omsamcolo and Omcomas; *C. virgata*, Kütz., Table Bay. She also records the following doubtful species: *C. capensis*, Ag., Cape; *C. aculeata*, S., Algoa Bay; *C. radiosa*, S., Algoa Bay, mouth of the Zwadtkap.

All the species represented in Tyson's collection are large and it is quite evident that several of the smaller species of *Cladophora* will have to be added to the collection. We have found at least two of these smaller species, one of which we have identified as *C. rupestris*, Kütz.

Near the train terminus at Sea Point we found abundant material of *C. Eckloni* and *C. flagelliformis* and noted the following points. The latter is by far the coarser of the two and is blue green in colour while the former is a bright green. *C. Eckloni* is found in shallow pools, further from the shore than *C. flagelliformis* which usually frequents somewhat deeper pools.

19. BRYOPSIDACEAE.

1. *Bryopsis setacea*, Her.

Sea Point, Table Bay.

(Kei mouth, Port Natal. Barton(1).)

B. caespitosa, Suhr.

Cape Morgan.

(Seal Island, shore of British Kaffraria. Barton(1).)

B. Flanaganii, E. J. B.

Mouth of the Kei.

B. sp.

Cape Morgan.

Note. In addition to these, Miss Barton(1) records the following: *B. africana*, Aresch., Saldanah Bay to False Bay; *C. plumosa*, Ag., Kalk Bay, Cape Point, Camps Bay.

22. CAULERPACEAE.

1. *Caulerpa Ligulata*, Harv.

Cape Morgan, Kalk Bay, Somerset Strand.

(Simon's Bay, Cape Agulhas, Cape Recife, Algoa Bay, Kei mouth
Natal. Barton(1).)

C. Bartoniae, G. Murr.

Kowie, Cape Morgan.

(British Kaffraria. Barton(2).)

C. Holmesiana, G. Murr.

Kowie, Cape Morgan.

(Algoa Bay, Kei mouth. Barton(1).)

C. Zeyheri, Kütz.

Kowie, Cape Morgan.

(Algoa Bay, Kei mouth. Barton(1).)

C. racemosa (Forsk.) W. van Bosse. Var. *clavifera*.

Isipingo, Durban. (Also Umkomaas, Delf.)

Note. Miss Barton (1, 2) adds the following species to the above.

C. clavifera, J. Ag., Knysna and Natal; *C. chemnitzia*, Lam., Port
Natal; *C. plumaris*, Ag., Kowie and Cape Morgan.

23. CODIACEAE.

6. *Udotea conglutinata* (Soland) Lam.

Durban, Isipingo.

Note. Miss Barton(2) records *U. Desfontainesii*, Dene, from Natal, but
does not mention *U. conglutinata*.

7. *Halimeda cuneata*, Hering.

Algoa Bay, Cape Morgan, Kei, Kowie.

(Natal. Barton(1).)

8. *Codium tomentosum*, Ag.

Cape Morgan, Algoa Bay, Knysna, Bonivanaland coast, Table
Bay.

(From the mouth of the Olifants River to Port Natal, Sea Point,
False Bay. Barton(1).)

C. tenue, Kütz.

Kowie, Kei, Cape Morgan, Hagahaga mouth.

(Cape Agulhas. Barton(1).)

C. Lindenbergii, Bind.

Algoa Bay, East London, Kowie, Cape Morgan, False Bay.

Note. Miss Barton(1, 2) adds the following to the above: *C. Bursa*, Ag.,
Natal; *C. mucronatum*, J. Ag., Sea Point, Cape; *C. adhucens*, Ag.,
Knysna and Port Elizabeth.

We have one record of *C. Bursa* being washed up at Camps Bay
after rough weather.

Pseudocodium de Vriesii, Web. von Bosse.

Cape Morgan, Kei.

(Isipingo. Barton⁽²⁾.)

Note. This genus is not mentioned in Engler and Prantl, but as both West⁽¹⁾ and Oltmanns⁽⁷⁾ recognize the genus it is added at the end of the Codiaceae, together with the next genus, *Codiophyllum*, which Engler and Prantl⁽⁵⁾ place at the end of the family as being of doubtful systematic position.

Codiophyllum natalense, Gray.

Kowie.

24. VALONIACEAE.

3. *Appohnia rugulosa*, Murray.

Cape Morgan, Kowie, Kei mouth.

(Algoa Bay, Cape, Natal. Barton⁽¹⁾.)

5. *Chamaedoris annulata*, Mont.

Durban.

(Table Bay. Barton⁽¹⁾.)

11. *Anadyomeme stellata*, Ag.

Durban.

PHAEOPHYCEAE.

1. ECTOCARPACEAE.

Note. In all the collections made between S. James' and Glencairn during October and November of this year we have found a brown filamentous alga which we have placed provisionally in the genus *Pylaiella*.

2. *Ectocarpus*, sp.

Cape Morgan.

Note. Miss Barton⁽¹⁾ records the following species: *E. parvulus*, Kütz., Cape Agulhas; *E. confervoides*, Le Jol., Kalk Bay; *E. simpliciusculus*, Ag., Kalk Bay; *E. siliculosus*, Lyngb., Cape, South Africa; *E. granulatus*, Ag., Cape.

We have found several species of *Ectocarpus* between Kalk Bay and S. James' during October and November. Certain of the smaller species may have been overlooked earlier in the year, but we suspect that their development may be seasonal. The only species that we have named with certainty is *E. siliculosus*, Lyngb. The other species we have named provisionally: *E. confervoides*, Le Jol. (this is an extremely large species reaching as much as three feet in length in the small bathing pool at Kalk Bay); *E. simpliciusculus*, Ag. (epiphytic on various other Algae), and *E. Hincksiae*, Harv. (represented by one small specimen only).

Note. Miss Barton⁽²⁾ records another genus of the Ectocarpaceae, viz. *Streblonema Codii*, n. sp. from Knysna.

3. SPHACELARIACEAE.

- 8.
- Phloiocaulon squamulosum*
- , Geyler.

Kowie.

(Port Natal, Cape Agulhas, Algoa Bay. Barton⁽¹⁾.)

- 9.
- Anisocladus congestus*
- , Reinke.

Table Bay.

Note. Miss Barton⁽¹⁾ records several members of this family not represented in Tyson's collection. The following are taken from her list: *Sphacelaria tribuloides*, Menegh., Port Natal; *S. furcigera*, Kütz. on *Suhria vittata* and *Ecklonia buccinalis*; *Stypocaulon paniculatum*, Kütz., Port Natal; *S. scoparium*, Kütz., Table Bay, Robben Island, Cape Point, Cape Agulhas, Port Natal; *S. funicularare*, Kütz., Table Bay, False Bay.

The only one of these which we have found is *Sphacelaria furcigera*, epiphytic on *Plocamium coccineum* at Glencairn.

4. ENCOELIACEAE.

- 12.
- Phyllitis fascia*
- , Kütz. var.
- undulata*
- .

Cape Morgan.

(Kaffraria. Barton⁽²⁾.)

- 14.
- Asperococcus bullosus*
- , Lamour.

Cape Morgan.

(Cape. Barton.)

Note 1. Miss Barton⁽¹⁾ records the following species of *Asperococcus* in addition to the one recorded above: *A. sinuosus*, Roth., Cape Point, Knysna, Port Natal; *A. compressus*, Griff., Cape; *A. clathratus*, Bory., Mostert's Bay.

Note 2. We have found at Camps Bay and in the small bathing pool at Kalk Bay a plant which belongs to neither of the genera mentioned above. We have named it provisionally *Scytosiphon lomentarius* (Lyngb.), J. Ag., but this determination has still to be verified.

6. DESMARESTIACEAE.

- 2.
- Desmarestia ligulata*
- , Lamour, var.
- herbacea*
- .

Table Bay, Three Anchor Bay.

(Camps Bay. Barton⁽¹⁾.)

Note. Miss Barton⁽¹⁾ records the following additional members of the family: *Desmarestia ligulata* var. *firma*, from the Cape; and *D. aculeata*, Lam., from the Cape.

10. CHORDARIACEAE.

- 8.
- Myriocladia capensis*
- , J. Ag.

Sea Point.

(Cape. Barton⁽¹⁾.)

14. *Leathesia difformis*, (L.) Aresch.

No locality given.

(Cape Point, Cape, Sea Point. Barton(1).)

Note. We have found this species very generally distributed on the shores of the Cape Peninsula. It is frequently epiphytic on *Pycnophycus brassicaeformis*.

16. *Mesogloia vermicularis*, Ag. = *Mesogloia vermiculata* (Engl. Bot.), Le Jol.

No locality given.

Note. Miss Barton(1) records *Mesogloia virescens*, Carm. (*Eudesme virescens*, Carm.), J. Ag. from Cape Point and the Cape.

18. *Chordaria capensis*, Kütz.

Table Bay.

(Sea Point, Cape Point, Kalk Bay, Knysna. Barton(1).)

Note. Miss Barton(1) records the following species in addition to *C. capensis*: *C. flagelliformis*, Ag., Camps Bay, Table Bay, Knysna; *C. sordida*, Bory., Table Bay, South Africa.

11. STILOPHORACEAE.

2. *Stilophora rhizoides*, J. Ag.

Hagahaga mouth.

13. SPOROCHNACEAE.

6. *Carpomitra chytrophora*, Kütz.

Cape Morgan, British Kaffraria, Kei mouth, Bomvanaland coast. (Natal. Barton(2).)

14. RALFSIACEAE.

2. *Ralfsia verrucosa*, (Aresch.) J. Ag.

Locality not given.

(Sea Point, Kalk Bay, Knysna. Barton(1).)

15. LAMINARIACEAE.

9. *Laminaria pallida*, Grev.

Table Bay.

(Walfisch Bay. Barton(1).)

11. *Ecklonia buccinalis*, (L.) Hornem.

Table Bay.

(Camp's Bay, Gordon's Bay, False Bay, Cape. Barton(1).)

E. radiata, (Turn.) J. Ag.

Cape Morgan.

Note. *E. exasperata*, J. Ag. given by Miss Barton(1) in her paper is synonymous with *E. radiata*.

Miss Barton(1) includes in her list a plant named *Pinnaria fastigiata*, Endl. et Dies., which according to de Toni(4) should be included in *Ecklonia*.

Miss Barton(1) records *Lessonia nigrescens*, Bory. from Cape Agulhas.

21. *Macrocystis pirifera*, (Turn.) Ag.

Table Bay.

(Sea Point, Cape. Barton(1).)

Note. Miss Barton(1) records two other species, viz. *M. planicaulis*, Ag., Cape and *M. pelagica*, Aresch., Cape. De Toni (4) includes both of these in *M. pirifera*.

On examination of plants of *M. pirifera*, collected at Camp's Bay on the 26th November, we found that certain fronds at the base of the plant were fertile and bore sporangia in indefinite sori.

19. FUCACEAE.

4. *Splachnidium rugosum*, (L.) Grev.

Table Bay, Algoa Bay.

(Seal Island, False Bay, Sea Point, Knysna, Natal, Cape. Barton(1).)

7. *Fucus constrictus*, Harv.

Table Bay, Camp's Bay.

(Green Point, Cape. Barton(1).)

Note. Miss Barton(1) records two other species of *Fucus*, viz. *F. serratus*, L. and *F. vesiculatus*, L., both from the Cape.

14. *Scaberia*.

Note. There is no representative of *Scaberia* in Tyson's collection, but *S. Aghardii*, Grev. is recorded by Miss Barton(1) from Natal.

15. *Bifurcaria brassicaeformis*, Stackh. (= *Pycnophycus brassicaeformis*, Kütz.)

Table Bay.

(Cape Town, Cape Point, Sea Point, Muizenberg, Algoa Bay, Natal. Barton(1).)

Note. Miss Barton(1) also gives *B. tuberculatus*, Stackh., Table Bay, Cape Agulhas, Knysna, Cape, and *B. levigatus*, Kütz., Cape Agulhas.

16. *Cytoseira*.

Note. Tyson's collection has no representative of *Cytoseira*. Miss Barton(1) gives two species: *C. triquetra*, Ag., Cape; and *C. ericoides*, J. Ag., Cape Agulhas.

24. *Turbinaria*, sp.

Isipingo.

Note. Miss Barton(1) records *T. decurrens*, Bory. from Port Natal.

25. *Carpophyllum scalare*, Suhr.

Kowie.

(Cape. Barton(1).)

Note. Miss Barton(1) includes in her list a plant, *Contarinia australis* Endl. and Dies., which she thinks may be the same as *Carpophyllum scalare*.

26. *Sargassum longifolium*, Ag.

Cape Agulhas, British Kaffraria, Cape Morgan.

(Simon's Bay, Port Alfred, Natal, Cape. Barton(1).)

S. heterophyllum, Ag.

Kowie, Kei, Algoa Bay, S. Sebastian's Bay.

(Port Natal. Barton(1).)

S. lendigerum, Kütz.

False Bay, Algoa Bay, Kowie.

(Port Natal. Barton(1).)

Note. Miss Barton(1) records a number of species which are not represented in Tyson's collection. The following are the species: *S. elegans*, Suhr., Cape; *S. incisifolium*, Ag., Saldanah Bay, Table Bay, Kalk Bay, Cape Agulhas, mouth of Swart Valley, Knysna, Plettenberg Bay, Algoa Bay, Cape; *S. incisifolium* var. *nullipora*, Table Bay; *S. vulgare*, Ag., Knysna, Algoa Bay, Cape; *S. vulgare* var. *tenuifolium*, Port Natal; *S. affine*, J. Ag., Cape; *S. pyriforme*, Ag., Port Natal; *S. linifolium*, J. Ag., Swellendam (as Swellendam is inland, this locality is probably given in error); *S. bacciferum*, Ag., Cape.

DICTYOTALES.

DICTYOTACEAE.

2. *Stoechospermum Suhrii*, Kütz.

Algoa Bay.

Note. In Miss Barton's list this is given as *Zonaria marginata*, Suhr.

4. *Zonaria lobata*, (Ag.) J. Ag.

Algoa Bay, Bomvanaland coast, Natal.

(Knysna. Barton(1).)

Z. interrupta, (Lamour) J. Ag.

False Bay, Kowie, Kei.

(Table Bay, Cape Agulhas, Plettenberg Bay, Algoa Bay, Port Alfred, Port Natal, Cape. Barton(1).)

Z. sp.

Cape Morgan.

Note. Miss Barton(1) records *Z. plumbea*, Aresch. from Natal Bay.

5. *Padina Commersonii*, Bory.

Cape Morgan, Isipingo, Durban.

Note. Miss Barton(1) records *P. pavonia*, Gaill. from Port Natal.

6. *Haliseris serrata*, Aresch.

Kowie.

(Port Natal. Barton(1).)

H. ligulata, Suhr.

Kowie.

Table Bay, Algoa Bay, Algoa Bay to Natal. Barton(1.)

H. macrocarpa, Aresch.

Kowie.

(Port Natal. Barton(1).)

Note. Miss Barton(1) records the following additional species: *H. dichotoma*, Suhr., Omsamcolo, Port Natal; *H. polypodioides*, Ag., Algoa Bay, Port Natal; *H. delicatula*, Lam., Port Natal.

7. *Dictyota naevosa*, Suhr.

Kalk Bay, Plettenberg Bay, Kowie, Cape Morgan.

(Algoa Bay to Port Natal, Kei. Barton(1).)

D. fasciola, (Roth.) Lamour.

Kei, British Kaffraria.

(Cape Agulhas. Barton(1).)

D. dichotoma, J. Ag.

Kei, Cape Morgan, British Kaffraria.

(Cape Point, Kalk Bay, Algoa Bay, Port Natal. Barton(1).)

D. sp. (very like *D. Bartayresiana*, ex Herb. E. M. Holmes in Dr Becker's collection).

Simon's Bay, Algoa Bay.

D. sp. (appears to be close to *D. liturata*, J. Ag.).

Locality of the specimens in Tyson's collection uncertain. Either Algoa Bay or the Kowie.

Note. Miss Barton(1) records several species not represented in Tyson's collection, viz. *D. dichotoma* var. *implexa*, Cape Agulhas; *D. linearis*, Ag., Port Natal; *D. inscripta*, J. Ag., Kalk Bay; *D. denticulata*, Ag., Cape; *D. liturata*, J. Ag., Kalk Bay; *D. Pappeana*, Kütz., Kalk Bay; *D. polycarpa*, Sondl., Simon's Bay. (This last species is given as being doubtful.)

Homoeostrichus multifidus, (Harv.) J. Ag.

Kalk Bay.

(Cape. Barton(1).)

Note. In Engler-Prantl(5) this genus is included in *Zonaria*, and we are following de Toni in placing it in a separate genus.

I. Bangiales.

RHODOPHYCEAE.

1. BANGIACEAE.

Porphyra vulgaris, Ag.

Sea Point. (Also recorded from Robben Island, Table Bay, Kalk Bay.

Barton(1).)

P. laciniata, Ag.

Table Bay, Three Anchor Bay, Algoa Bay, Kowie. (Also recorded from Seal Island, Knysna, Port Natal. Barton⁽¹⁾; and Kalk Bay. Delf.)

P. capensis, Kütz. Regarded by some as a form of *P. laciniata*.

Table Bay.

P. Augustineae, Kütz.

Sea Point. (Also Robben Island. Barton⁽¹⁾.)

Note on the Genus Porphyra.

The species of *Porphyra* are somewhat ill defined, and require further investigation. The genus is of general occurrence on the shores of the Peninsula, and is very abundant at the high tide level on the rocks and boulders of both east and western coasts. We find that in *P. laciniata*, the larger fertile fronds bearing carpospores occur high on rocks, whilst smaller paler fronds bear monospores and are found lower down or beneath the larger purplish fronds.

II. Florideae.

(a) NEMALIONALES.

3. HELMINTHOCADIACEAE.

3. *Chantransia*, sp. ? *secundata*.

Note. There was no specimen of this genus in the Tyson collection, but we have found a specimen bearing monospores thickly coating the stipe of an old frond of *Ecklonia buccinalis* thrown up on the shore at Hout Bay. (*C. secundata* on *Laminaria* is recorded by Barton⁽¹⁾ from "near Cape Town.")

6. *Nemalion furcellatum*, n. sp. Reinbold.

Cape Morgan. One specimen.

Note on Nemalion furcellatum.

This seems to be an exceedingly rare form. It has been seen "only at Three Anchor Bay as an annual and seldom after the New Year." The specimens are all sterile, and were described by Tyson⁽⁹⁾ (Journ. Bot. June 1921, LI, p. 200).

7. *Helminthostachya anstantio*, J. Ag.

Cape Morgan. One specimen.

Note. Miss Barton⁽¹⁾ records also *Helminthora divaricata* as occurring at the Cape.

4. CHAETANGIACEAE.

1. *Scinaia furcellata*, (Thurn.) Bivon.

Cape Morgan, Great Kei mouth. (Also Cape Point. Barton⁽¹⁾.)

S. salicornioides, Kütz., J. Ag.

Submerged rocks, Sharks Bay, Kowie. (Also Port Natal. Barton.)

3. *Galaxaura obtusata*, (Soland) Lamour.

Isipingo, Natal. (Also Port Elizabeth, Algoa Bay, Port Natal. Barton⁽¹⁾.) One specimen.

G. Beckeri, Schmitz.

Submerged rocks, Kowie. One specimen.

G. marginata, (Lam.) (*Brachycladia marginata*, Soland; *Zanardinia marginata*, J. Ag.).

Kowie, Port Alfred.

Note on genus Galaxaura.

Miss Barton⁽¹⁾ records *G. umbellata* from Natal (*vide* Kützing).

5. *Chaetangium saccatum*, (Lamour) J. Ag.

Tide washed rocks, Table Bay, Sea Point, Green Point. (Also Kalk Bay. Barton⁽¹⁾.)

C. ornatum, (L.) Kütz.

Pools and rocks, Table Bay, Walfisch Bay. (Also Seal Island, Simon's Bay, Cape Point, Cape Agulhas. Barton⁽¹⁾, 1893; and Kei mouth. Barton⁽²⁾, 1896.)

Note on the genus Chaetangium.

The species *C. ornatum* is very abundant on the coast of the Cape Peninsula, and from previous records is evidently of wide distribution. It is a common form in the mid-tidal regions in pools and on rock ledges on both the east and west shores.

C. saccatum, on the other hand, is less abundant, and occurs at lower tidal levels, in shallow rock pools, or occasionally growing on a bare rock face. It is most abundant on the west coasts, and grows at Camp's Bay in association with *Splachnidium*, fruiting freely, but at Sea Point it is less common and at Kalk Bay we have only seen small dwarfed plants, sterile and growing in small clusters usually on the flat tops of high rocks left with shallow pools at low tides. According to Barton, *C. Zeyheri*, Kütz. also occurs on the Cape coasts.

5. GELIDIACEAE.

4. *Wrangelia purpurifera*, (Harv.) J. Ag. (= *Callithamnion purpuriferum*).

Table Bay, Sea Point rocks, Three Anchor Bay, on *Anisocladus*, etc.

8. *Gelidium cartilagineum*, (L.) Grev. Gaill.

The Kowie, Cape Morgan, Kei, rock pools and ledges, False Bay. (Also Robben Island, Kalk Bay, Camp's Bay, Cape Agulhas, Knysna. Barton⁽¹⁾.)

G. pinnatifidum, (J. Ag.) Schmitz.

Kowie. Two specimens.

G. pristioides, J. Ag., Kütz. (= *Suhria pristioides*, J. Ag.).

False Bay, Port Alfred, Simon's Bay Rock, deep water, Cape Agulhas, Kowie.

G. rigidum, Kütz.

Cape Morgan, Kowie.

G. corneum, Ag.

Cape Morgan, Kei mouth. (Also Algoa Bay, Port Alfred, Mossel Bay, Natal, Sea Point. Barton(1).)

G. crinale.

Cape Morgan. (Also Kalk Bay. Delf.)

G. serratum, Kütz. (= *Thysanocladia Africana*, Schmitz).

Kowie. Two specimens.

Note on the genus Gelidium.

In our experience, the two species *cartilagineum* and *pristioides* are by far the most common of the above genus. *G. cartilagineum* is especially common and abundant on the coast of False Bay, and lines the vertical faces of the rocks at Kalk Bay at or near the low water level in low spring tides. We have found it fertile early in June. *G. pristioides* is often epiphytic on *Ecklonia stipes*. Both are exposed only at low tides.

10. *Suhria vittata*, (L.) J. Ag.

On stem of *Ecklonia buccinalis*, Table Bay. (Also Robben Island, Muizenberg, Cape Point, Sea Point, Gordon's Bay, Kalk Bay, Camp's Bay, and Cape Agulhas. Barton.)

Note on the genus Suhria.

S. reptans, Grun. is recorded for the Cape, but Grunow thinks it may be simply a dwarf or young form of *S. pristioides*. *S. vittata* according to a note on one of Tyson's specimens is the alga alluded to in the *Swiss Family Robinson* as made into a jelly by Cape Colonists who call it "chinchow." We have not met with this custom here.

12. *Ptilophora spissa*, (Suhr.) Kütz.

Kei mouth. One specimen.

(b) GIGARTINALES.

7. GIGARTINACEAE.

3. *Irideae capense*, J. Ag.

Pools and rock ledges, Table Bay. (Also Seal Island, Simon's Bay. Barton(1); also Camp's Bay. Delf.)

I. elongata, Suhr.

Pools and rock ledges, Table Bay to Walfisch Bay. This species is not mentioned by Barton.

Note on the genus Irideae.

We have only found these plants exposed at low tide level in spring tides. The fronds in the Tyson collection are either sterile or tetrasporic forms. We have found carposporic fronds of *I. capense* in deep pools at low water, Camp's Bay, Nov. 1920.

Miss Barton mentions several other species as belonging to the Cape:

I. orbitosa, *Augustineae*, *Agathoicus*, *serratifolia*, *cordata*, *curvata*, *cornea*, *laminarioides*, *undulata*, *gigantea* and *insignis*. The fronds are very variable in form and size, and we have not found it possible to distinguish these.

4. *Gigartina radula*, Ag.

Pools and rock ledges, Table Bay; a smaller form also from Knysna. (Also Robben Island, Kalk Bay, Sea Point. Barton(1); and Camp's Bay. Delf.)

Nearly all the specimens are either sterile or carposporic fronds, but one tetrasporic frond also occurs.

G. stiriata, J. Ag.

Submerged rocks, Table Bay. (Also Kalk Bay, Sea Point, Cape Point, Cape Agulhas. Barton (1); and Camp's Bay. Delf.)

All the specimens appear to be sterile or carposporic.

G. Burmanni, J. Ag.

Submerged rocks, Table Bay. (Also Simon's Bay, Sea Point. Barton(1); and also Three Anchor Bay, Hout Bay and Camp's Bay. Delf.)

G. fastigiata.

Rock pools and ledges, Table Bay. The specimens show sterile, carposporic and tetrasporic plants. (Also Robben Island, Sea Point, Cape Point, Kalk Bay and Natal. Barton(1).)

G. pistillata, (Gmel.) Stackh.

Algoa Bay, Kowie.

G. Teedii, Lam.

Cape Morgan, Walfisch Bay. (Also Port Alfred. Barton(1).)

G. insignis, Schnitz (syn. *Irideae insignis*, Endl. and Dies.).

Deep water, Kowie. (Also Port Natal. Barton.) One specimen.

G. Tysoni n. sp., Reinbold.

Camp's Bay, Sea Point, Three Anchor Bay. This is probably a deep water form as it has only been found as a "wash-up" of occasional occurrence (Journ. Bot. June, 1912).

Notes on the genus Gigartina.

The species of *Gigartina* are very variable in form, and apparently hybridisation may occur between *G. Teedii* and *G. pistillata* (Barton, Journ. Bot. May and Nov. 1896).

G. radula is very variable in size; the smaller sterile fronds are sometimes inflated. In the herbarium specimens, this is indicated by a stuffing with cotton wool. We have only seen this in nature on bright warm days; examination of the inflated fronds suggests no sign of disease but rather an accumulation of gaseous products of assimilation. Nearly all the material is carposporic, only two sheets showing specimens with tetraspores. We have found both forms growing side by side

at Sea Point (August 22, 1920), but the tetrasporic plants were much less numerous as well as less conspicuous.

G. Burmanni and *G. stiriata*, are both abundant especially on the west coast and around Table Bay. They are commonly found together at low tide levels, and are often exposed by neap as well as spring tides. All the specimens of *G. Burmanni* in the Tyson collection as well as all those we have seen growing, are either sterile or tetrasporic, whilst all the specimens of *G. stiriata* are also either sterile or carposporic¹. The structure of the young sterile fronds seems to be identical, but the carposporic fronds become papillate whilst the tetrasporic remain smooth. It seems very probable that these two "species" are in reality simply the sexual and asexual generations of the same plant. Both these occur in association with *G. radula*, which is also abundantly represented.

7. *Gymnogongrus dilatatus*, (J. Ag.).

Low tide Table Bay, rocks and ledges. (Also Green Point, Cape Point, Gordon's Bay. Barton(1).)

G. capensis, (Ag.).

Green Point, Table Bay. (Also Cape Point, Kalk Bay, Cape Agulhas and Knysna. Barton(1).)

G. polycladus, (Kütz.), Ag.

Cape Morgan. (Also Kalk Bay. Barton(1).)

Note. According to Barton, another species, *G. corymbosus*, occurs at Cape Point and at False Bay.

8. *Actinococcus aggregatus*, Schm.

Cape Morgan.

This is parasitic on *Gymnogongrus vermicularis* and on *G. dilatatus*. I have found it on *G. dilatatus* at extreme low tide at Camp's Bay (Oct. 1920).

10. *Mychodea episcopalis* (Harv.).

Cape Morgan. One specimen.

13. *Callophyllis discigera*, J. Ag.

Not given. (At Table Bay, False Bay, Knysna. Barton(1).)

C. Hombroiana (?).

Waterloo Bay. One sterile specimen.

Note. According to Barton(1), *C. laciniata* occurs at Batterie Amsterdam, and *C. fastigiata* at Cape Agulhas.

15. *Callymenia dentata*, J. Ag.

Three Anchor Bay, Great Kei mouth. (Also Cape Agulhas, Algoa Bay. Barton(1).)

C. schizophylla, Harv.

¹ This appears to be true also of specimens of these species in the Harvey Collection (Cape Town) and in the British Museum (S. Kensington).

Small form, on *Gigartina* sp. Table Bay; larger fronds, deep water, Table Bay. (Also Port Natal. Barton(1).)

C. Harveyana, J. Ag.

Deep water, Table Bay. (Also Cape Point. Barton(1).)

16. *Glaphrymenia Porphyroides*, J. Ag.

Submerged rocks, Shark's Bay, Kowie. One specimen. (Also the Cape, Barton(2), 1896.)

8. RHODOPHYLLIDACEAE.

7. *Meristotheca Natalensis*, J. Ag.

Near Cape Morgan. (Also Port Natal. Barton.) This specimen has been examined by Reinbold and also Barton. Both judge it to be *M. Natalensis*, but neither had the opportunity of comparing it with the type specimen.

14. *Rhodophyllis capensis*, Kütz.

Deep water, Table Bay, Kalk Bay. Two specimens formerly labelled "*Pollexfenia luciniata*" have been renamed *R. capensis* by Tyson.

16. *Rhabdonia Natalensis*, Reinbold, n. sp.

Near Cape Morgan. This species was described in Journ. Bot. 1912. There are two specimens, both in the tetrasporic stage. (*R. violacea* occurs at the Cape according to Barton.)

22. *Thysanocladia Africana*, Schmitz (= *Gelidium serratum*, Kütz.).

(c) RHODYMENIALES.

9. SPHAEROCOCCACEAE.

1. *Phacelocarpus echinatus* (Suhr.).

The Kowie, submerged rocks, Hagahaga mouth.

P. epipolaeus (Holmes) (= *P. disciger*, Holmes and Batters).

The Kowie, Cape Morgan. (See Trans. Bot. Soc. Edinburgh, 1893, p. 79.) (Also Port Alfred. Barton(2), 1896.)

P. tortuosus (Endl. and Dies.).

Port Alfred. One specimen. (Also Cape Agulhas, Port Natal. Barton.)

P. semitortus, Schmitz.

Locality not recorded. One specimen.

Note. Two other species are recorded by Barton(1)—*P. tristichum* from Port Alfred, and *P. Labillardieri*, (Ag.), Port Alfred.

3. *Heringia mirabilis*, Ag.

Submerged rocks, Shark's Bay, Kowie. (Also Robben Island, Table Bay, Gordon's Bay, Sea Point, Cape Point, Camp's Bay, Knysna, Algoa Bay, Port Alfred. Barton(1).)

9. *Sarcodia capensis*, Ag.

The Kowie. (Also the Cape. Barton(1).)

10. *Trematocarpus flabellatus*, (J. Ag.) (= *Dicurella flabellatus*).
Kowie, rock pools and ledges, Table Bay, Dyer's Island. (Also Cape Point, Sea Point, Cape Agulhas. Barton(1).)
- T. fragilis*, J. Ag. (= *Dicurella fragilis*).
Rock pools and ledges, Table Bay. (Also Cape Point, Robben Island, Cape Agulhas, Knysna, Algoa Bay, Port Alfred. Barton.)
- T. affinis*, J. Ag. (= *Dicurella affinis*, Ag.).
Sea Point, rock pools, Table Bay. (Also Robben Island, Kalk Bay, Cape Point. Barton(1).)
15. *Gracilaria confervoides*, (L.) Grev.
Table Bay, Rogge Bay landing. One specimen marked "cosmopolitan."
G. dentata.
Over Gordon Bluff, Durban. One small faded specimen.
G. capensis, (Schmitz).
Port Alfred, the Kowie.
G. denticulata, Schmitz.
Submerged rocks, Shark's Bay, Kowie.
16. *Corallopsis aculeatus*.
Submerged rocks, Kowie. (Annals. Bot. VIII.)
17. *Calliblepharis fimbriata*, J. Ag.
Submerged rocks, Kowie, Cape Morgan. (Also Cape Agulhas, Algoa Bay, Port Alfred, the Cape. Barton(1).)
- 17 a. *Tyleiophora Beckeri*, Ag.
Rock ledges, Kowie. (Also Port Alfred, the Cape. Barton(1), 1893, and Algoa Bay, British Kaffraria. Barton(2), 1896.)
- Note. This species is not mentioned by Engler (Nat. Pfl.), but is very close to a *Calliblepharis* (Kütz.) both in structure and in form of nemathecias. If the former species is dropped, this should presumably be named *Calliblepharis Beckeri*.
19. *Hypnea spicifera*, J. Ag.
The Kowie, Cape Morgan.
These are large specimens, 1—2 ft. in length. Smaller specimens, 4—7 ins. are from False Bay. We have found this form in abundance at Kalk Bay, on rocks at low spring tides. (Also Table Bay, Cape Point, Simon's Bay, Cape Agulhas, Knysna, Algoa Bay, Port Alfred. Barton(1).)
- H. musciformis* (Wulf).
Epiphytic on various Algae, Shark's Bay, Kowie, Cape Morgan, submerged rocks, British Kaffraria. (Also Cape Agulhas. Barton(1).)

H. Eckloni (Suhr.).

On various Algae, Table Bay, Walfisch Bay, Three Anchor Bay, Somerset West, Strand. (Also Port Alfred. Barton⁽¹⁾.) On one specimen, Tyson has written "united with *H. musciformis*."

Note on the genus *Hypnea*.

Other species mentioned by Miss Barton are: *H. episcopalis*, the Cape; *H. ceramioides*, (Kütz.), the Cape; *H. spinella*, Natal and *H. armata*, Simon's Bay.

10. RHODYMENIACEAE.

4. *Hymenocladia kallymenioides*, (Holm) Schmitz.

On *Gelidium cartilagineum*, Shark's Bay, Kowie. A similar specimen from Becker's Herbarium is labelled *H. Kowiensis*, and *Microcoelia kallymenioides* (Journ. Bot. 1896, xxxiv, p. 196).

Note. *H. polymorpha*, J. Ag. is reported by Barton for Port Alfred.

5. *Rhodymenia capensis*, (Grev.) J. Ag.

Walfisch Bay. Only one specimen. (Also Port Alfred, Isipingo. Barton⁽²⁾, 1896.)

Note. *R. palmetta*, J. Ag. from Algoa Bay is recorded by Miss Barton⁽¹⁾.

7. *Epymenia stenoloba*, Schmitz.

Walfisch Bay, Cape Morgan. Submerged pools and rocks, Shark's Bay, Kowie.

E. obtusa, (Grev.) Kütz.

At base of *Ecklonia buccinalis*, Table Bay. (Also Muizenberg. Barton⁽¹⁾, 1890; and Walfisch Bay. Barton⁽²⁾, 1896.)

11. *Chrysimenia Uvaria*, (L.) J. Ag.

Submerged rocks, Shark's Bay, Kowie.

Three sheets are labelled *Myrioglossa Beckeriana*, Holmes, from Kowie Beach and Cape Morgan. This is the same as *Myriophylla Beckeriana* (Holmes⁽⁷⁾, Ann. Bot. VIII, 342), and according to de Toni⁽⁴⁾ (vol. IV, sec. II, p. 550), this genus is indistinguishable from the genus *Chrysimenia* in structure and in the cystocarps. It seems better therefore to arrange these specimens with the genus *Chrysimenia*.

13. *Lomentaria capensis*, (Harv.) Endl.

Pools and ledges, low tide, Table Bay. (Also Muizenberg, Simon's Bay, Kalk Bay. Barton⁽¹⁾.)

L. patens, Kütz.

Walfisch Bay. One specimen.

L. corallina, Kütz.

Cape Morgan, Kowie.

These specimens have been variously named as *Gastridium corallinum*, *L. corallina*, and *Erythroclonium corallinum*.

Note. A specimen labelled *Caloglossa Leprieurii*, Harv., seems to belong here as some species of *Lomentaria*.

14. *Champia compressa*, Harv.

Shark's Bay, Kowie. (Also Kalk Bay, Muizenberg, Cape Agulhas, Kynsna, Algoa Bay and Port Alfred. Barton (1).)

We found very young fronds of this alga at Kalk Bay at low spring tides near the water's edge on June 20; when quite fresh they had an iridescent appearance.

C. lumbricalis, (Roth.) Lamour.

Rocks and ledges, low tide, Table Bay. (Also Robben Island, Sea Point, Cape Point, Cape Agulhas. Barton.)

Note. This alga is fairly abundant at Camp's Bay where we have found it fertile, exposed only at low spring tides, usually on flat rock surfaces. The tetrasporic and carposporic plants are almost indistinguishable until the cystocarps are well developed. It is comparatively rare in our experience at Kalk Bay.

17. *Plocamium corallorhiza*, (Turn.) Harv.

Deep water, Table Bay, Kowie, Cape Morgan. (Also Robben Island, Cape Point, Cape Agulhas, Cape Recife, Port Alfred, Kei mouth and Natal. Barton (1).)

I have found this only at low water during low spring tides on rocks at Kalk Bay. In June the plants were all fertile bearing tetraspores.

P. Robertsiae, Schmitz.

The Kowie. Only two specimens, from Becker's Herbarium.

P. cornutum, (Turn.) Harv.

Kalk Bay, Three Anchor Bay. (Also Table Bay, Sea Point, Camp's Bay, Cape Agulhas, Natal. Barton (1).)

P. rigidum, Kütz.

Three Anchor Bay in pools. (Also Muizenberg. Barton (1), 1893; and Kowie. Barton (2), 1896.)

P. condensatum, Kütz.

Cape Agulhas.

Note. On one specimen Tyson has written that *P. rigidum* and *P. condensatum* are identical forms. On examination of the specimens, we found that the former species are all carposporic and the latter are all tetrasporic plants, which may possibly account for the slight differences between them.

P. coccineum, Lingb.

Cape Morgan. (Also Table Bay, Kalk Bay, Algoa Bay, Natal. Barton (1).) We have also found this form at Glencairn (Oct. 1920).

P. Fulleri, Schmitz.

Submerged rocks, Kowie. Only one specimen.

P. glomeratus, J. Ag.

Rock pools, Sea Point, Nov. 1895. One specimen. (Also Table Bay, False Bay. Barton(2), 1896.)

P. nobile, J. Ag.

Submerged rocks, Table Bay. One specimen. (Also Simon's Bay, Cape Recife. Barton(1), 1890; and Kowie, Natal. Barton(2), 1893.)

P. leptophyllum.

Waterloo Bay, and Kowie. The sheet is marked "Reinhold scripsit."

Note on the genus Plocamium.

Other species are mentioned by Barton as occurring in the Cape region: *P. subfastigiatum*, Kütz., Natal; *P. Mertensii*, J. Ag.; and *P. procerum* at the Cape and Algoa Bay.

11. DELESSERIAACEAE.

1. *Martensia elegans*, (Her.).

Durban Bluff, 1907; Isipingo, 1912. (Also Port Natal. Barton(1).)

3. *Nitophyllum venosum*, Harv.

Deep water, Table Bay, Rogge Bay; small form from Three Anchor Bay.

N. fissum, (Grev.).

Base of *Ecklonia* fronds, Table Bay. (Also Camp's Bay and Knysna. Barton(1).)

N. uncinatum, (Turn.) J. Ag.

Sea Point, Durban. (Also Kei mouth. Barton(1).)

N. reptans, Cru.

Durban. (Also Cape Point. Barton(1).)

This is regarded by Tyson as possibly a smaller form of *N. uncinatum*.

N. maculatum.

On various algae, Kowie, Knysna, East London, Port Alfred, Durban.

N. Kowiensis, Schmitz.

The Kowie. One specimen.

Note on the genus Nitophyllum.

Other species recorded by Miss Barton are: *N. Platycarpum*, Robben Island, Table Bay, Cape Point, Green Point, Camp's Bay, Cape Agulhas, Knysna, Algoa Bay; *N. undulatum*, Simon's Bay; *N. capense*, Table Bay; *N. acrospermum*, the Cape; *N. pinnatifidum*, Algoa Bay; *N. serratum*, the Cape.

6. *Botryoglossum platycarpum*, (Turn.) Kütz.

Pools at low tide, Table Bay. This is a monotypic and endemic plant.

8. *Neuroglossum Binderianum*, Kütz.

Deep water, Table Bay, Three Anchor Bay, Port Nolloth, Robben Island. This is a monotypic and endemic form.

11. *Delesseria ruscifolia*.

Not represented. (Recorded at Sea Point and coast of Natal. Barton(1).)

We found this plant in low tide pools at Sea Point, bearing carpospores, Sept. 1920.

D. Bartoniae, Schmitz.

Submerged rocks, Kowie.

Note. Two other species are mentioned by Barton(1): *D. imbricata*, Port Alfred, and *D. ovifolia*, Kütz., the Cape.

12. *Botryocarpa prolifera*, Grev.

At base of *Ecklonia buccinalis*, Table Bay. This is also a monotypic endemic form.

16. *Sarcomenia miniata*, J. Ag.

Deep water, Table Bay, Three Anchor Bay, Cape Morgan. Sheets marked "fide Reinbold." (According to Barton, *S. miniata*, J. Ag. = *Polysiphonia clathrata*, Suhr., and occurs also from Algoa Bay. Barton(3), 1896.)

Note on the genus Sarcomenia.

S. intermedia is recorded from the Cape by Barton.

Holmesia capensis, (J. Ag.).

Shark's Bay, Kowie.

Note. This genus is not mentioned by Engler, but it is placed by Barton in the Delesseriaceae, and seems to be close to the genus *Delesseria*. Two specimens.

12. BONNEMAISONIACEAE.

3. *Delisea Suhrii*, J. Ag.

Deep water, False Bay, St Sebastian's Bay. (Also Cape Agulhas, Algoa Bay. Barton(1).)

13. RHODOMELACEAE.

1. *Laurencia virgata*, Ag.

Submerged rocks, Shark's Bay, Kowie. (Also Seal Island, Cape Agulhas. Barton(1).)

L. flexuosa, J. Ag.

Submerged rocks, Shark's Bay, Kowie. (Also Cape Agulhas, Knysna. Barton(1).)

L. pinnatifida, Lam.

Plettenberg Bay. (Also Seal Island, Algoa Bay. Barton(1).)

L. elata, Harv.

Port Alfred, Kei mouth, Waterloo.

L. hybrida, J. Ag.

Kei mouth.

L. obtusa, Lam.

Kowie, Somerset Strand, False Bay, Cape Morgan. (Also Cape Agulhas, Algoa Bay. Barton(1).)

Note on the genus Laurencia.

Other species mentioned by Barton are: *L. corymbosa*, Ag., the Cape; *L. Botryoides*, Ag., Muizenberg, Kalk Bay, Cape Agulhas; *L. divaricata*, Ag., the Cape; *L. Forsteri*, Ag., the Cape; *L. papillosa*, Grev., Cape Recife, Algoa Bay, the Cape; *L. moriformis*, Kütz., the Cape; *L. concinna*, Mont., Port Natal; *L. laxa*, Grev., the Cape, Natal Bay.

6. *Chondria capensis*, (Harv.) J. Ag.

Rock ledges, Table Bay to Walfisch Bay.

13. *Pachychaeta brachyarthra*, Kütz.

Shark's Bay, Kowie, Port Beaufort.

Note. *P. griffithsioides* is also mentioned by Barton(1).

15. *Polysiphonia virgata*, (Ag.) Spreng.

On stem of *Ecklonia buccinalis*, Table Bay, Robben Island, Mouille Point. (Also Camp's Bay, Kalk Bay, Cape Agulhas, Kynsna. Barton(1).)

P. atrorubescens, Grev.

Rogge Bay. (Also Table Bay. Barton(1).)

P. sertularioides, J. Ag.

British Kaffraria, Cape Morgan. (Also Port Elizabeth. Barton, 1896(2).)

P. cloiophylla, Ag.

Cape Morgan. (Also Camp's Bay. Barton(1).)

This is represented by two specimens named by Flanagan, but renamed by Tyson *Pterosiphonia cloiophylla* var. *patens*. These specimens have therefore been placed with the genus *Pterosiphonia*.

P. urbana, Harv.

Tidal rocks, Sea Point (labelled "Fide Miss Barton"), Three Anchor Bay.

P. urceolata, (Lightf.) Grev.

Algoa Bay, U.S.A. (Also Table Bay. Barton(1).)

P. tenebrosa, (Harv.).

Sand covered rocks and pools, Table Bay. Sea Point, Three Anchor Bay. (Also Muizenberg. Barton(1).) We have found

this plant occasionally at Sea Point and also Kalk Bay in similar habitats.

P. corymbosa, (Ag.) Harv.

P. corymbifera, Ag. Harv.

Sea Point in pools on *Codium tomentosum*.

Note on the genus *Polysiphonia*.

Other species recorded by Miss Barton are: *P. fasciculifera*, Kütz., the Cape; *P. Acanthina*, J. Ag. (*Rhytiphlea dumosa*, Harv.), False Bay; *P. prorepens*, Harv., Algoa Bay, Port Elizabeth; *P. Heringii*, Harv., Algoa Bay; *P. corymbifera*, Ag., Table Bay, Natal; *P. arenaria*, Houts Bay, and Muizenberg; *P. incompta*, Harv., Muizenberg, Kalk Bay, Simon's Bay; *P. Stangeri*, Harv., Port Natal; *P. monocarpa*, Montag., the Cape; *P. Gaudichaudi*, Ag., the Cape; *P. parasitica*, Grev., the Cape; *P. nana*, Kütz., Table Bay; *P. falcata*, Kütz., the Cape; *P. Pappeana*, Kütz., the Cape; *P. juncea*, Kütz., the Cape; *P. linocladia*, Kütz., the Cape.—According to Miss Barton (1), p. 176): "Grunow finds no specific difference between *P. virgata*, (Ag.), *complanata* Sp., *Gaudichaudi*, J. Ag., and *fasciculifera*, Kütz. I entirely agree with him, except *P. complanata* which seems to me to resemble more nearly *P. cloiophylla*, Ag."

In our experience the species of *Polysiphonia* are not frequently met with excepting *P. urbana* in tetrasporic form from Glencairn, Kalk Bay, and St James, i.e. on the sandstone of False Bay. *P. virgata* is the only species we have observed at Camp's Bay.

34. *Bostrychia mixta*, (Harv.), and Hook.

Sheltered spots, rock crevices, Algoa Bay, Port Elizabeth. (Also Muizenberg, Cape Point, Simon's Bay, Kalk Bay, Knysna. Barton(1).) We have found this plant on sheltered vertical rock faces about mid-tide level at Kalk Bay.

Note. *B. tenella*, J. Ag. and *B. Binderi* are recorded by Miss Barton as both occurring at Port Natal and False Bay.

41. *Rhodomela botryocarpa*, Harv.

Cape Morgan, Port Nolloth. This is also named *Caulacanthus ustulatus*, Kütz.

Note. *R. subfusca* is also recorded by Barton as occurring at Table Bay and Cape Point.

45. *Herposiphonia Heringii*, (Harv.).

On various algae, Table Bay, Port Natal.

H. prorepens.

On *Amphiroa Ephedrae*, Table Bay.

50. *Placophora Binderiana*, J. Ag.

On *Codium*, Algoa Bay, Kowie. (Also Port Elizabeth, on *Amphiroa* and *Codium*. Barton(1).)

52. *Polyzonia elegans*, (Suhr.).

Cape Morgan, Kei mouth on *Gelidium* and *Polysiphonia*, Kowie.
(Also Algoa Bay, Port Alfred, Port Natal. Barton(1).)

58. *Vidalia serrata* (Suhr.).

Kei mouth. (Also Port Natal. Barton(1).)

65. *Heterosiphonia dubia*, (Suhr.).

On various small algae, Table Bay, Three Anchor Bay. On one sheet is the note that *H. dubia* = *Dasya dubia* = *H. crispa*.

H. pellucida, (Harv.).

Cape Morgan. (Also Muizenberg. Barton(1).) One specimen.

On the sheet is written "The real plant of Harvey often confounded with *H. dubia* (*D. dubia*, Suhr.) Reinbold."

67. *Dasya scoparia*, Harv.

Submerged rocks, Kowie, Cape Morgan. (Also Green Point, Kei mouth, Port Natal. Barton(1).)

14. CERAMIACEAE.

5. *Griffithsia corallina*, Lightf. Ag.

Rock pools, low tide, Sea Point, Three Anchor Bay. (Also Table Bay. Barton(1).) We found this species at Glencairn bearing tetraspores, Oct. 1920.

G. secunda, Harv.

Sea Point. (Also Muizenberg. Barton.)

Note. *G. caespitosa*, Harv. is recorded for False Bay (Barton).

9. *Monospora*, (Solier) = *Corynospora ramulosa*, J. Ag.

Submerged rocks near Kei mouth.

10. *Pleonosporium Harveyanum*, (J. Ag., de Toni) = *Halothamnion Harveyanum*, (J. Ag.).

Submerged rocks, British Kaffraria; low tide rocks, Table Bay.

P. Tysoni, Barton.

On *Gigartina radula*, Table Bay, Three Anchor Bay. I have found this plant at St James (False Bay) at half tide on plants of *Cladophora hospita*. For a description of this plant see Barton(2), Journ. Bot. xxxiv, p. 195, 1896.

11. *Callithamnion stuposum*, (Suhr.).

Submerged rocks, Algoa Bay, Kowie. One specimen from Flanagan's herbarium named *Dasya scoparia* has been renamed by Tyson, *C. stuposum*.

C. verticillatum. No locality given.*C. purpuriferum*, Ag. (= *Aristothamnion purpuriferum*).

Not recorded. (Cape Point, Kalk Bay, Table Bay. Barton(1).)

Note. Other species recorded by Barton are: *C. constrictum*, Port Natal;

C. gracile, Simon's Bay; *C. variegatum*, Algoa Bay; *C. densum*,

the Cape; *C. sertularioides*, Table Bay; *C. striatulum*, the Cape.

15. *Haplolegma Africanum*, Kütz.
Isipingo, Natal. Only two specimens.
18. *Ptilota cryptocarpa*, Holmes.
Cape Morgan.
19. *Euptilota Pappeana* (*Ptilota Pappeana*), Ag.
Deep water, Table Bay. (Also Kalk Bay. Barton(1).)
24. *Ballia Beckeri*, Schmitz.
Shark's Bay, Kowie.
30. *Spyridia cupressina*, Harv.
Submerged rocks, Kowie.
S. horridula.
Cape Morgan. One specimen.
S. glomulifera (Bracebridge).
Cape Morgan. One specimen.
S. filamentosa, Harv.
Cape Morgan. (Also Port Natal. Barton.)
S. plumosa, Schmitz.
Submerged rocks, Kowie.
- Note. *S. squalida*, J. Ag., Port Alfred, and *S. insignis*, J. Ag., Port Alfred, and Port Natal are also recorded by Barton(1), 1893, and *S. squalida* by Barton(2) from Kowie, 1896.
31. *Carpoblepharis flaccida*, (Turn.) Kütz.
On fronds of *Ecklonia buccinalis*, Table Bay, Camp's Bay, Sea Point, Three Anchor Bay, Walfisch Bay, Port Nolloth. (Also Robben Island, Green Point, Kalk Bay, Knysna. Barton(1).)
C. minima, Barton.
On *Laminaria pallida*, Table Bay. Two specimens.
C. pinnatifolia, Kütz. (*Dasyopsis pinnatifolia*, Suhr.).
Algoa Bay. One specimen.
32. *Ceramium gracillimum*, Harv.
On *Corallina* sp., Cape Morgan. (Also Cape Point, Kalk Bay and Knysna. Barton(1).)
C. diaphanum, Lightf. Roth.
Woodstock Beach, Walfisch Bay, Bomvanaland coast.
C. miniatum.
On *Plocamium corallorhiza*, Cape Morgan. One specimen. We have found a similar form at St James epiphytic on *Cladophora hospita*.
C. cancellatum, Ag.
Table Bay, on various Algae. (Also Cape Point, Cape Agulhas. Barton(1), 1893; and Port Nolloth. Barton(2), 1896.)

C. obsolatum, Ag.

Cape Morgan. (Also Robben Island, Seal Island, Table Bay, Cape Agulhas, Knysna. Barton⁽¹⁾, 1893; and Walfisch Bay, British Kaffraria. Barton⁽²⁾, 1896.)

C. rubrum, Ag.

Three Anchor Bay, Sea Point, on *Codium tomentosum*. (Also Cape Point, Natal. Barton⁽¹⁾.)

C. clavulata, Ag.

On various algae, Table Bay.

(This may be the same form as "*Centroceras clavulata*" of Barton⁽¹⁾, Seal Island, Robben Island, Table Bay, Sea Point, Cape Point, Kalk Bay, Muizenberg and Knysna.)

C. flexuosum.

Three Anchor Bay.

Note. Other species mentioned by Barton⁽¹⁾ are: *C. strictum*, Robben Island; *C. capense*, the Cape; *C. circinnatum*, Cape Point; *C. pulchellum*, Table Bay on *C. cancellatum*; and *C. Poeppigeanum*, Grun., Port Natal.

40. *Thamnocarpus glomeruliferus*, J. Ag.

Cape Morgan.

(d) CRYPTONEMIALES.

16. GRATELOUPIACEAE.

1. *Halymenia*.

The Kowie. This species is unnamed, but resembles *H. ligulata*.

2. *Aeodes ulvoides*, Schmitz.

Submerged rocks, Kowie. (Also Natal. Barton⁽²⁾, 1896.)

Ae. orbitosa, Suhr.

Not recorded. (Also the Cape. Barton⁽²⁾, 1896.)

Ae. digitata, Schmitz (*Halymenia palmatifida*, Becker).

Cape Morgan, Kowie.

3. *Cyrtymenia cornea*, Kütz. Schmitz.

Pools and deep water, Table Bay.

C. hieroglyphica, J. Ag. Schmitz.

Pools and deep water, Table Bay.

Note. According to sheets from Becker's herbarium, *C. cornea*, Schmitz is synonymous with *Pachymenia rugosa*, Holmes, and *Iridea cornea*, Kütz.

4. *Grateloupia flicina*, J. Ag.

Rock pools, Table Bay. (Also Sea Point, Cape Point, Kalk Bay, Cape Agulhas and Knysna. Barton⁽¹⁾.)

G. hieroglyphica, J. Ag.

Three Anchor Bay. One specimen. (Also Table Bay. Barton(1).)

5. *Pachymenia carnosa*, J. Ag.

Pools and deep water, Table Bay, and Cape Agulhas. (Also Camp's Bay. Barton(1).)

8. *Prionitis nodifera*, (Her.) Barton.

Rock pools, Shark's Bay, Kowie.

9. *Polyopes constrictus*, (Turn.) J. Ag.

Pools and submerged rocks, Table Bay. (Also Cape Point. Barton(1).)

11. *Carpopeltis Beckeri*, Schmitz.

The Kowie. One specimen.

12. *Cryptonemia* (?) *capensis*.

Submerged rocks, Kowie. This specimen was previously named *Kalymenia capensis*, but was re-named as above "fide Barton."

18. NEMASTOMACEAE.

2. *Schizymenia apoda*, J. Ag. Locality not given.

S. erosa, J. Ag.

Simon's Bay.

S. undulata, J. Ag.

Rock pools, Table Bay, Rogge Bay, Green Point.

S. obovata, J. Ag.

Three Anchor Bay, Table Bay.

Note. Enclosing some specimens is a paper with the following note in Miss Barton's writing, "The Cape *Schizymenias* are not surely cleared and fixed. *S. erosa* is distinct enough, but *S. apoda*, *obovata* and *undulata* show many transitions and it is not sure if they are valuable species. It is necessary to make observations on the growing plants."

8. *Nemastoma lanceolata*, (Harv.), J. Ag.

Deep water, Table Bay. These specimens are very variable in form; two have the words "red currant jelly" written on them, referring possibly to the colour and consistency when fresh.

19. RHIZOPHYLLIDACEAE.

4. *Chondrococcus Hornemanni*, (Kütz.) Schmitz = *Desmia Lambertii*, Suhr.

Deepwater, False Bay, Cape Morgan, Kowie. (Also Cape Agulhas, Algoa Bay, Port Alfred, Port Natal. Barton(1).)

C. tripinnata, Schmitz (= *Desmia tripinnata*, J. Ag.).

Deep water, False Bay. (Also Natal, St Sebastian's Bay. Barton(1), 1893; and British Kaffraria. Barton(2), 1896.)

20. *SQUAMARIACEAE*.6. *Peysonniella major*, Kütz.

Submerged rocks, Shark's Bay, Kowie.

P. replicata, Kütz.

Kowie.

21. *CORALLINACEAE*.4. *Mastophora hypoleuca*, Harv.

Isipingo, Natal, Durban, The Bluff. (Also Port Natal. Barton(1).)

Note. *M. spelligera* is also recorded by Barton from Port Natal.

6. *Lithothamnion corticiformis*, Kütz.

Cape Morgan, overspreading *Laurencia* sp. (Also on *Gelidium cartilagineum*, Robben Island, Sea Point, Port Alfred. Barton(1).)

Note. *L. brassica-florida*, and *L. polymorphum* are also recorded by Barton from Algoa Bay.

7. *Amphiroa Ephedra*, (Lamk.) Decne.

Durban Bluff, Kei mouth. (Also Kalk Bay, Cape Agulhas, Knysna, Cape Recife, Algoa Bay, Port Natal. Barton(1).)

Note. Other species mentioned by Barton as occurring at the Cape are:

A. anceps, Decne; *A. firma*, Kütz.; *A. multifida*, Kütz.; *A. capensis*, Aresch.; *A. heterocladia*, Kütz.; *A. Bowerbanki*, Harv.; *A. contracta*; *A. involuta*, Kütz., *A. dubia*, Kütz.; *A. exilis*, Harv.; *A. Lamourouxiana*, Decne; and *A. dilatata*, Lam.

8. *Cheilosporium cultratum*, Aresch.

British Kaffraria. (Also Kalk Bay, Knysna, Algoa Bay, Port Natal. Barton(1).)

Note. Other species mentioned by Barton are: *C. Stangeri*, Aresch., Port Natal; *C. sagittatum*, Aresch., Algoa Bay, Natal; and *C. flagellatum*, Aresch., Port Natal.

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W. TYSON, F.L.S.

BY S. SCHONLAND.

WILLIAM TYSON was born at Port Royal, Jamaica, in March 1851. His father was a Wesleyan missionary. He started the study of Medicine but relinquished it in consequence of loss of tactical sensibility in the hand, no doubt due to rheumatism which later deformed both his hands, a great handicap throughout life. He came with his parents to Cape Colony and became a teacher, holding successively positions in the S. Afr. College School, Capetown, at Kokstad, at Donald Strahan's place, S. John's River, then at Dale College, Kingwilliamstown. He resided for a time at Kimberley and in 1888 was appointed Secretary to the Comte de Vasselot, the head of the Forest Department of Cape Colony. About 1893 he left the Forest Department and was attached to the Agricultural Department as librarian and sub-editor of the *Agricultural Journal*. In 1904 he was retired on pension and about 10 years ago he began to reside at Port Alfred. In September 1919 he proceeded to Coffee Bay on the Pondoland coast and returned to Grahamstown in a moribund condition in April 1920. He passed away April 13th.

He was one of the most indefatigable of recent botanical collectors. The later volumes of the *Flora Capensis* bear testimony to the large extent and value of his collections. Many new species discovered by him were named after him and also one genus, *Tysonia* (Boraginaceae). The chief stations where his collections were made are Port Elizabeth (Ap.—Nov. 1877), Murraysburg (July 1886—Dec. 1887), Western districts, chiefly Cape Town and Hex River (Jan. 1880—June 1882), Griqualand East and Pondoland (his most extensive sets, July 1882—July 1886), Kingwilliamstown (July 1886—Dec. 1887), and in recent years Port Alfred. He disposed of his herbarium to the Cape Government Herbarium in 1892, retaining only Marine Algae which he continued collecting for a number of years chiefly for the British Museum under the direction of Dr George Murray and Miss Ethel Barton who published an account of his collections in the *Journal of Botany*, 1893. The choice of Port Alfred as his place of residence during recent years was largely determined by the richness of the Marine Algal Flora in its neighbourhood. He prepared a number of sets of S. African Marine Algae for sale. Two fascicles each containing 50 species were issued by him, but circumstances connected with the war and probably also increasing infirmity prevented the completion of further issues.

Tyson was very well read. He had a splendid memory for plants and their



WILLIAM TYSON, F.L.S.

names. He was of a cheerful disposition and, on occasions, a brilliant conversationalist. If sometimes he showed a little bitterness and even recklessness one could not help excusing it on account of the harsh manner in which fate had dealt with him.

Note. In 1913 Mr Tyson's "study-set" of marine algae was purchased by the Bolus Herbarium, and at his request is known as "The Tyson-Collection of Marine Algae." This is now available for the use of students, having been arranged in systematic order by Dr Delf and Miss Michell, whose account of the Collection appears in this Part.

EXPLANATION OF PLATES

PLATE III

- A. *PAGELLA ARCHERI*, SCHONL. B. *AGAPANTHUS PENDULUS*, L. BOLUS.
C. *ERICA PLENA*, L. BOLUS. D. *ERICA EUSTACEI*, L. BOLUS. E. *ERICA BRACHYSEPALA*, GUTHR. AND BOLUS.

- A. Fig. 1, plant viewed from above; 2, do., from below; 3, longitudinal section through young plant; 4, do., older plant; 5, upper portion of leaf; 6, bud; 7, do., from above; 8, flower; 9, do., from above; 10, petals and stamens; 11, hypogynous scale; 12, gynaeceum, with scales; 13, do., longitudinal section; 14, do., transverse section—variously magnified.
B. Portion of peduncle, with one flower, nat. size.
C, D, E. Fig. 1, node; 2, leaf; 3, flower; 4, bracts and calyx; 5, sepal; 6, corolla; 7, stamen, side view; 8, do., front view; 9, gynaeceum—variously enlarged.

PLATE IV

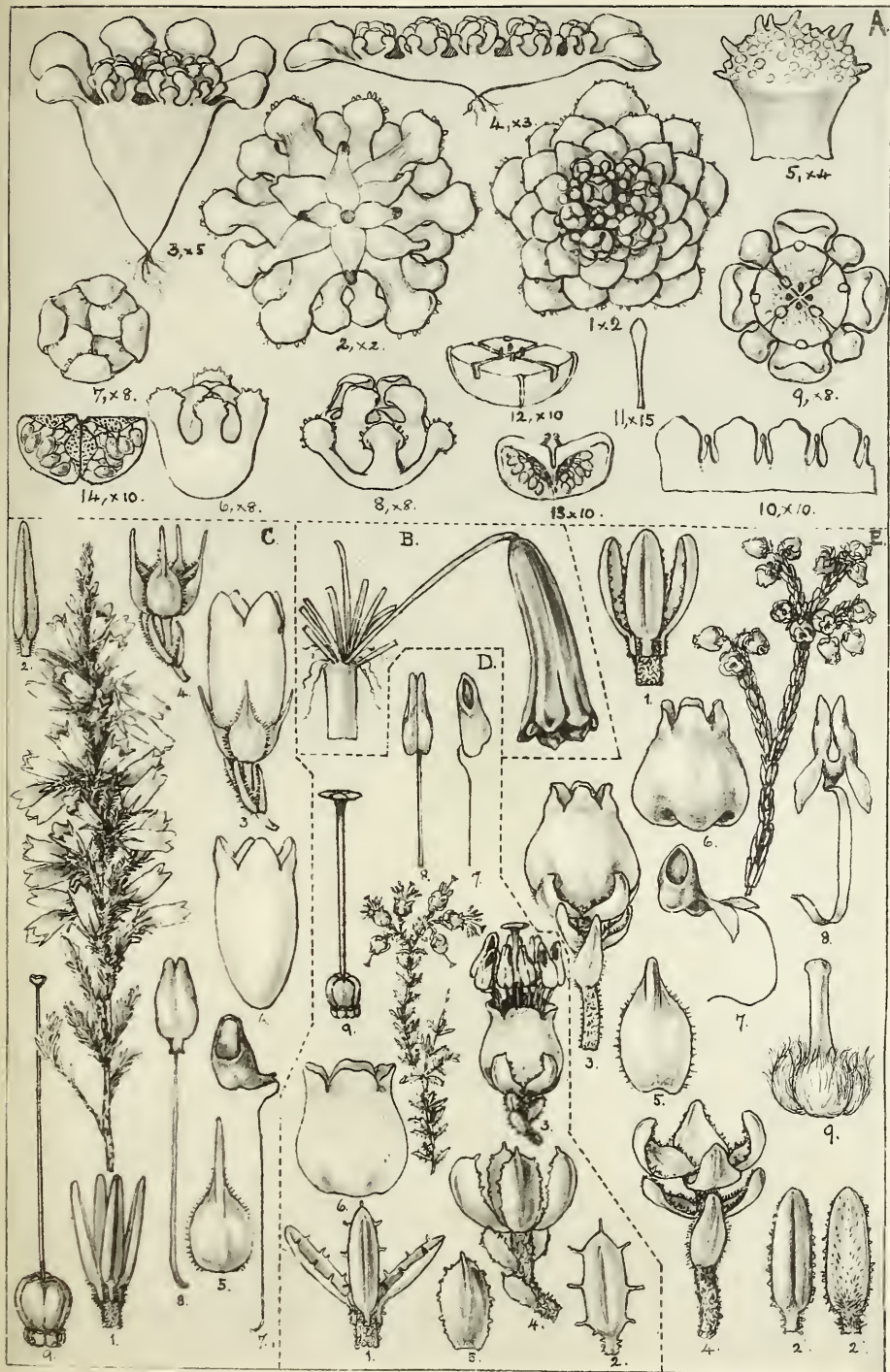
- A. *ERICA CYATHIFORMIS*, SALISB. *CYATHIFORMIS*. B. *ERICA FLAVISEPALA*, GUTHR. AND BOLUS. C. *ERICA GOATCHERIANA*, L. BOLUS. D. *ERICA STOKOEI*, L. BOLUS.

- A, B, C, D. Fig. 1, node; 2, leaf; 3, flower; 4, bracts and calyx; 5, sepal; 6, corolla; 7, stamen, side view; 8, do., back view; 9, gynaeceum—variously enlarged.

PLATE V

- A. *RESTIO MACOWANI*, PILLANS. B. *RESTIO ARIDUS*, PILLANS. C. *RESTIO TABULARIS*, PILLANS. D. *RESTIO SIMILIS*, PILLANS. E. *RESTIO HUMILIS*, PILLANS. F. *RESTIO MARLOTHII*, PILLANS.

- A, B, C, D. Fig. 1, male inflorescence, nat. size; 2, spikelets or spikelet of do.; 3, flower of do.; 4, spathe; 5, bract—variously enlarged; 6, female inflorescence, nat. size; 7, spikelets or spikelet of do.; 8, flower of do.; 9, gynaeceum; 10, spathe; 11, bract—variously enlarged.
E, F. Fig. 1, female inflorescence, nat. size; 2, spikelets or spikelet of do.; 3, flower; 4, gynaeceum; 5, spathe; 6, bract—variously enlarged.



A. *Pagella Archeri*, Schndl.

B. *Agapanthus pendulus*, L. Bolus.

C. *Erica plena*, L. Bolus.

D. *Erica Eustacei*, L. Bolus.

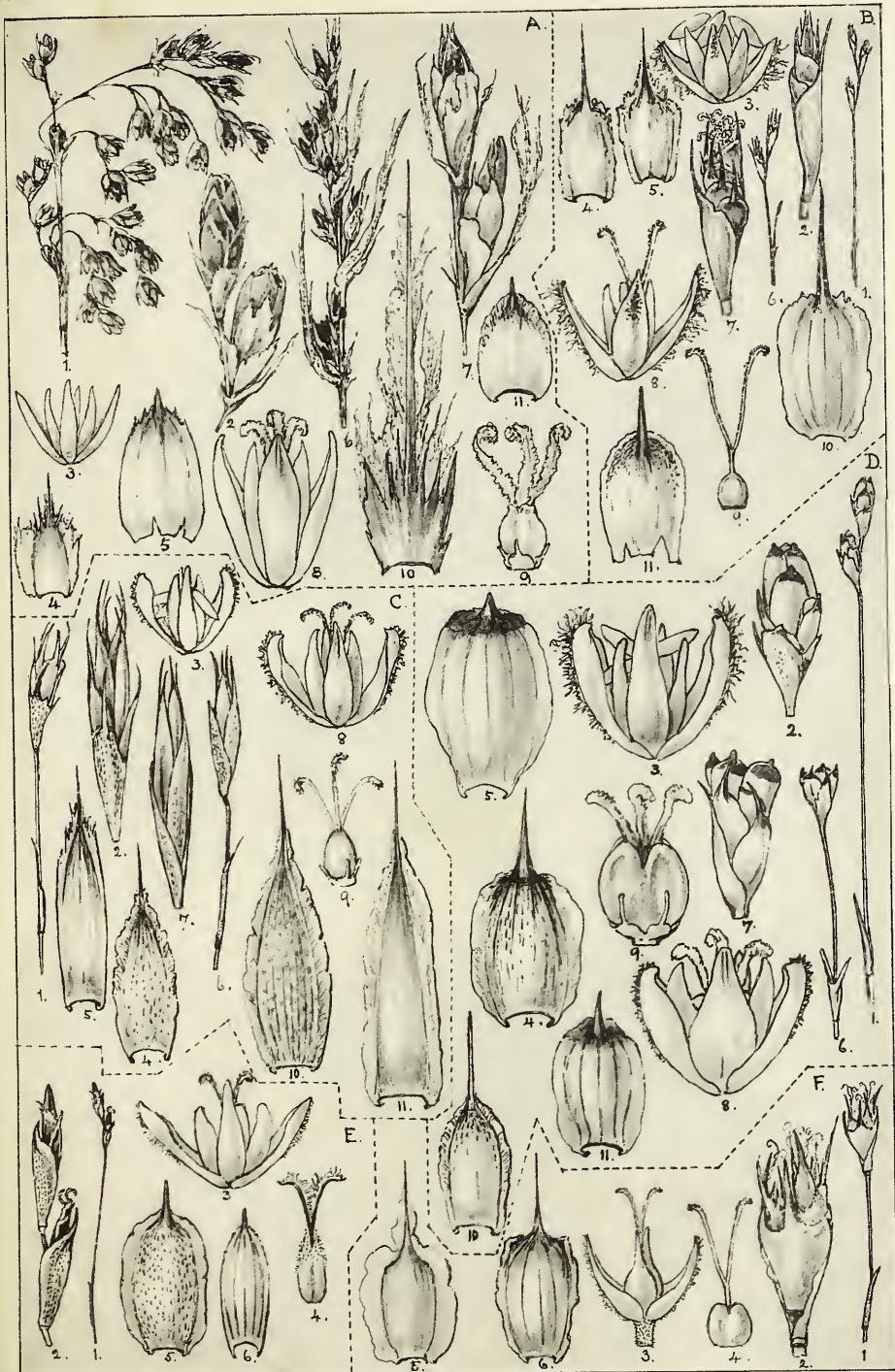
E. *Erica brachysepala*, Guthrie and Bolus.



A. *Erica cyathiformis*, Salisb.
C. *Erica Goatcheriana*, L. Bolus.

B. *Erica flavisepala*, Guth. and Bol.
D. *Erica, Stokoei*, L. Bolus.





A. *Restio MacOwani*, Pillans.

C. *Restio tabularis*, Pillans.

E. *Restio humilis*, Pillans.

B. *Restio aridus*, Pillans.

D. *Restio similis*, Pillans.

F. *Restio Marlothii*, Pillans.

NOVITATES AFRICANAE

Mesembrianthemum ausense, L. Bolus (§ *Ringentia*), ab omnibus ceteris sectionis petalis albis, stylis 10 differt.

Folia obovato-spathulata, supra fere plana, subtus e medio carinata, marginibus carinaque 3—6-dentata, dentibus patentibus, glauco-viridia, ad 3 cm. longa, 1.3—1.5 cm. lata, 1 cm. diam.; flores solitarii, breviter pedunculati, 4.3 cm. diam.; calyx turbinatus, segmentis 4, inaequalibus, duobus carinatis, 1.5 cm. longis, duobus ovatis acutis, late membranaceo-marginatis, 1 cm. longis; petala linearia obtusa, ad 2 cm. longa, 0.2 cm. lata; stamina numerosa collecta, apice subdiffusa, 0.8—1 cm. longa, filamentis albidis ebarbatis, antheris 0.1 cm. longis, lobis luteis, connectivo notate conspicuo, viridi lucidoque; discus annularis crenulatus; ovarium supra planum, 0.5 cm. diam., stylis 10, filiformibus, 1.1 cm. longis, basi pro 0.2 cm. longitudinis connatis.

South-West Africa: Aus, *C. W. Lewis* (National Botanic Gardens, No. $\frac{543}{18}$); *G. C. Phillips* (id. No. $\frac{381}{19}$).

A very distinct species in the section *Ringentia* by reason of the white petals and the ten styles.

Described from a specimen which flowered at Kirstenbosch in June 1919.

M. Vermeuleniae, L. Bolus, epapulosum, nanum glabrum caudice tuberoso, ad 1.5 cm. diam., apice ramoso, ramis abbreviatis crassis, ramulis confertis saepissime 4-foliatis; folia fere erecta vel patenti-incurvata, basi semiteretia, supra medium valde compressa carinataque, acuta vel acute acuminata, glauco-viridia, saturate viridi-punctata, 2—3 cm. longa, basi 1 cm., medio 0.6 cm., apicem versus 0.3 cm. lata, 0.4—0.7 cm. diam.; flores solitarii 5-meri, 2.5—3 cm. diam.; calyx turbinatus, segmentis inter se fere aequilongis, ovato-lanceolatis acutis, tribus membranaceo-marginatis, ad 0.9 cm. longis; petala 2—3-seriata linearia obtusa, basin versus parum angustata, alba, inter se fere aequilongia, vel 1—2 intima multo breviora; ad 1.1 cm. longa, 0.2 cm. lata; stamina multi-seriata, mox diffusa, 0.3—0.4 cm. longa, filamentis barbatis, antheris luteis, staminodiis 2—3-seriatis, apice recurvis; glandulae discretae, crenulatae; ovarium supra valde convexum, stylis erectis, deinum patulis, subulatis acuminatis, ad 0.45 cm. longis.

Kalahari Region: Griqualand West; Niekerk's Hoop, April 1921, *M. Wilman* (Bolus Herbarium, No. 15194).

Described from a living specimen which flowered in my garden in September 1921.

M. Beswickii, L. Bolus, *M. acutipetalo* affine sed foliis glaucis, floribus 6-meris, petalis pallide roseis differt.

Caudex subtuberosus, ramis abbreviatis, ramulis confertis, saepius 6-foliatis; folia paris cujusque fere aequilonga, adscendentia vel patentia, apice incurva basi connata, medio obtuse, apicem versus acute, triquetra, acuta glabra viridi-punctata, infima 2.5 cm. longa, basin versus 1 cm. lata, cetera 3.3 cm. longa, basin versus 0.7—0.8 cm. lata; flores solitarii, fere sessiles, 3.5 cm. diam.; calyx fere semi-globosus, segmentis inaequilongis triquetris acuminatis, duobus ad 1.5 cm. longis, ceteris lato membranaceo-marginatis, 1—1.2 cm. longis; petala numerosissima 2—3-seriata, acuta vel obtusa, basi pallidiora vel alba, ad 1.4 cm. longa, 0.125 cm. lata; staminodia recurva numerosa, circa 3-seriata, exteriora 1 cm. longa; stamina conferta vel exteriora subrecurva, 0.3—0.8 cm. longa, filamentis glabris, vel interioribus parce barbatis, antheris luteis; discus annularis crenulatus, 0.1 cm. diam.; ovarium supra convexum, stylis lineari-subulatis acuminatis, 0.5 cm. longis.

Kalahari Region: Transvaal; near Johannesburg, collector unknown (National Botanic Gardens, No. $\frac{248}{20}$).

Allied to *M. acutipetalum*, N. E. Br., but differs in having the leaves glaucous and the two of each pair almost equal in length, by the 6-parted flowers, and the pale rose petals.

Described from a living specimen which grew in Mr Beswick's garden in Queenstown and which was given to the National Botanic Gardens where it flowered in Dec. 1921.

M. velutinum, L. Bolus, caule crasso, multo abbreviato, ramulis brevissimis confertis 2—4-foliatis; folia cum pedunculo calyceque velutina, sat polymorpha, alterum paris altero longius vel multo longius, patentia vel adscendentia, basi connata, oblonga, supra subconca, superne triquetra, valde compressa vel breviora leviter compressa, interdum apice carinata, breviora subdimidiata, glaucoviridia, 2—4.5 cm. longa, basi ad 1.8, medio ad 1.5 cm. lata, ad 1.4 cm. diam.; flores solitarii, 6-meri, 4 cm. diam., pedunculo crasso, cum calyce valde compresso, 2.3 cm. longo, apice circa 1 cm. diam.; calyx subcrateriformis, segmentis inter se inaequalibus, oblongis vel linearibus, acutis vel apice carinatis, duobus dorsaliter carinatis, ad 1.9 cm. longis, ceteris 0.9—1.4 cm. longis, tribus membranaceo-marginatis; petala erecto-patentia 2-seriata lineari-spathulata obtusa, dilute rosea, saturate roseo-vittata, 1.8—2 cm. longa, 0.2 cm. lata; stamina collecta, filamentis parce barbatis, pallidis, ad 0.7 cm. longis, antheris pallidis; glandulae nectariferae dis-

cretae, transverse oblongae; ovarium supra globose convexum, insigniter profunde lobatum et verticale et horizontale, stylis e basi segmentorum orientibus, globose subulatis, 0.3 cm. longis.

South Africa. Locality uncertain, but probably from the neighbourhood of Robertson. Flowered at the National Botanic Gardens, Kirstenbosch, October 1917 (Bolus Herbarium, No. 15195). On the first day the flower opened about 4 p.m. and soon closed. The following two days it kept open all day, closing in the evening. Only one flower was produced.

- M. Frithii, L. Bolus, epapulose glabrum, circa ad 6 cm. altum, ramosum, ramis decumbentibus, ad 9 cm. longis, 0.6 cm. diam., reliquis numerosis foliorum delapsorum onustis; folia paris cujusque subinaequilonga adscendentia vel folium brevius patenti-erectum vel patenti-incurvatum, basi connata, triquetra acuta apiculata vel acuminata, integra vel rarissimo marginibus dentatis, glauco-viridia, 2.5—4 cm. longa, 0.8 cm. lata; flores solitarii 5-meri, 2.5 cm. diam.; calyx turbinatus, segmentis inter se valde inaequalibus, duobus elongatis carinatis, 1.1 cm. longis, tribus ovato-oblongis membranaceo-marginatis, vix 0.6 cm. longis; petala circa 3-seriata linearia obtusa, basin versus gradatim attenuata, aurea, 0.6—1.2 cm. longa; stamina multiseriata cylindrico-collecta, apice recurva, flava, interioribus basi dense barbatis, 0.5—1 cm. longa; glandulae nectarii discretae integrae; ovarium supra planum vel levissime convexum, stylis filiformibus, stamina demum excedentibus, 1 cm. longis.

Aberdeen Road, *F. Frith* (National Botanic Gardens, No. $\frac{431}{18}$).
Grootfontein, *V. S. Peers* (*id.* No. $\frac{279}{19}$).

Described from living specimens which flowered at Kirstenbosch in 1919. The flowers open late in the afternoon.

- M. Englishiae, L. Bolus (§ Veruculata), glaberrimum, ramis prostratis elongatis, ad 50 cm. longis, ramulis erectis, dense foliatis, 0.3 cm. diam.; folia patentia vel saepius patenti-incurvata, basi connata, semiteretia obtusa, laevia nitentiaque vel interdum subpruinosa, ad 3.5 cm. longa, saepius 1.7 cm. longa, basi 0.7, medio 0.5 cm. lata; flores 4-meri, 3-nati vel abortione solitarii, pedunculati, pedunculis in calycem gradatim abeuntibus, more *M. defoliati*, saepius 1—1.6 cm. longis; calyx clavatus, segmentis basi pro 0.3 cm. coalitis, inter se valde inaequalibus, duobus ad 1 cm. longis, ceteris ad 0.5 cm. longis; petala connata pro tertiam partem longitudinis, linearia obtusa, basin versus angustata, integra vel inaequaliter dentata, albida, ad 0.2 cm. longa, 0.1—0.15 cm. lata; stamina multiseriata, tubo corollae adnata, exteriora radiate patentia, fere dimidium petalorum attingentia, ad 1.2 cm. longa, interiora collecta, 0.4 cm. longa vel ultra, filamentis ebarbatis, antheris luteis;

discus annularis crenulatus; ovarium conico-convexum, stylis subulatis acuminatis, 0.3 cm. longis.

Cape Province: South-Western Region; Robertson, *Miss N. English* (National Botanic Gardens, No. $\frac{2313}{17}$).

Described from living plants which grew luxuriantly and flowered freely at Kirstenbosch during November and December of 1919.

M. Wordsworthiae, L. Bolus, *M. curvifolio* affine, sed ramis elongatis prostratis, saepissime reptantibus, petalis pluri-seriatis, staminibus subdiffusis differt.

Glaberrima, caule abbreviato, ad 3 cm. alta, ramis primo caespitosis, dense foliosis, demum elongatis, internodiis ad 4.5 cm. longis; folia basi connata, erecto-incurvata, apice recurvata, vel patentia, vel recurvata, semi-teretia, acuta vel acuminata, rubro-apiculata, 1.5—2.8 cm. longa, 0.3—0.5 cm. lata; flores 5-meri solitarii, ad 2.7 cm. diam., brevissime pedunculati; calyx turbinatus, segmentis subaequilongis ovatis acuminatis, tribus ampliate membranaceo-marginatis; petala pluriseriata, interioribus paullo brevioribus, linearia obtusa, e medio attenuata, ad 1.1 cm. longa, ad 0.2 cm. lata; staminodia pauciora, staminibus aequilongis; stamina numerosa, filamentis medio vel infra medium barbatis, antheris luteis; discus annularis crenulatus; ovarium valde convexum, stylis subulatis acuminatis, 0.3 cm. longis.

Cape Province: South-Western Region; Caledon Div., Sir Lowry's Pass, alt. ca. 1500 ft., *R. Wordsworth* (National Botanic Gardens, No. $\frac{1899}{17}$).

Allied to *M. curvifolium*, Haw. but differs widely in habit of growth, the creeping branches elongating considerably, as well as by the petals being in several series and the somewhat diffuse stamens.

Described from specimens which have flowered freely at Kirstenbosch in May, June and even July for the last three years.

M. Vanzijliae, L. Bolus, glabrum, ramis elongatis reptantibus, internodiis 1.5—6 cm. longis, ramulis abbreviatis confertis, dense foliatis; folia patentia vel patenti-erecta, apice incurva, triquetra acuminata viridia, inconspicue pellucido-punctata, ad 5.5 cm. (saepius 3—4 cm.) longa, medio 0.6, infra medium 1 cm., lata; flores solitarii 5-meri, ad 6 cm. diam., pedunculati, pedunculis teretibus, 3—5 cm. longis; calyx turbinatus, segmentis subaequilongis lanceolatis acutis, tribus membranaceo-marginatis, 1—1.1 cm. longis; petala 4-seriata linearia acuta, inferne gradatim attenuata, saturate aurantiaca, 1—2.5 cm. longa, 0.1—0.3 cm. lata; stamina conferta, filamentis glabris atro-rubris, antheris luteis; discus inconspicuissimus; ovarium supra concavum, stylis incurvis, globose subulatis, saturate rubro-purpureis, 0.15—0.2 cm. longis; capsula globose turbinata, supra convexa, 2.1 cm. longa diametroque.

Cape Province: South-Western Region; Worcester, *Dorothy van Zijl* (Bolus Herbarium, No. 17141).

Described from plants which flowered freely during the spring of 1920 and 1921 in Mrs Dorothy van Zijl's garden, Claremont, near Cape Town.

The flowers of this species are among the most richly coloured known to me. The deep orange-red of the petals has the glow of burnished copper, and the dark red filaments and yellow anthers enhance the brilliancy.

M. brakdamense, L. Bolus, *M. sessili* affine, ut videtur, sed caule decumbente, ramulis 2—4 foliatis, foliis longioribus, supra haud concavis, differt.

Fruticulus rigidus glaberrimus ramosissimus, ramis ramulisque decumbentibus confertis, ad 23 cm. longis vel ultra, 0.6 cm. diam., ultimis brevissimis 2-foliatis vel, 2 foliis junioribus additis, 4-foliatis; folia connata per dimidium longitudinis, medio subteretia, apicem versus triquetra, apiculata, supra plana vel subconvexa, viridia, saturate viridi-punctata, ad 0.7 cm. longa, medio 0.4 cm. lata, 0.5 cm. diam.; flores solitarii 5-meri, ad 1.3 cm. diam., pedunculis ad 0.3 cm. longis; calyx turbinatus, segmentis inter se subaequilongis, ovatis, vix 0.4 cm. longis, tribus membranaceo-marginatis apiculatis; petala 1—2-seriata subaequilonga linearia, apicem versus vix ampliata, obtusa vel subacuta, roseo-purpurea, ad 0.5 cm. longa; staminodia staminaque conferta, filamentis albis, interioribus medio dense barbatis, 0.2 cm. longis, exterioribus infra medium barbatis, 0.3 cm. longis, antheris luteis; discus annularis crenulatus; ovarium supra convexum, stylis subulatis acuminatis, 0.1 cm. longis.

Brakdam, *N. S. Pillans*, 5757.

This appears to be near *M. sessile*, Thunb., unknown to me except from the description given by Sonder in the *Flora Capensis*. The longer leaves which are not concave above and which are usually in solitary pairs on the ultimate branchlets, and the decumbent stems (or branches) distinguish this species.

Described from specimens which flowered in Mr N. S. Pillans' garden, Rosebank, June 1921.

M. amicorum, L. Bolus (§ Tumidula), epapulosum glaberrimum, 30—40 cm. altum; rami ramulique adscendentes, 0.5 cm. diam. vel ultra, internodiis 0.6—1.5 cm. longis; folia fere erecta, vel unum paris incurvum, connata per 0.3—0.4 cm., fere teretia, supra plana, acuta apiculata, basi leviter angustata, glauco-viridia, saepe purpurascentia, 2.5—4 cm. longa, medio 0.5 cm. lata, 0.7 cm. diam.; flores bi-ternati 5-meri, ad 1.5 cm. diam., odorati, pedunculis 1—1.5 cm. longis, omnibus supra medium 2-bracteatis; calyx globose turbinatus, segmentis inter se subaequilongis,

ovatis, 0.3—0.4 cm. longis, duobus membranaceo-marginatis; petala 1—2-seriata lineari-spathulata, acuta vel obtusa, roseo-purpurea, 0.5—0.6 cm. longa, 0.15 cm. lata; staminodia staminaque collecta, filamentis roseo-purpureis, inferne pallidioribus, parce, vel interioribus dense, barbatis, 0.2—0.3 cm. longis, antheris luteis; discus annularis crenulatus; ovarium supra convexum, stylis anguste subulatis acuminatis, 0.3 cm. longis; capsula subpyriformis, ad 0.8 cm. diam.

Cape Province: South-Western Region; Montagu Div., nr Montagu, *Kensit* and *Cuporn* (National Botanic Gardens, Nol. $\frac{261}{14}$). Same locality, *I. Arbuthnot* (National Botanic Gardens, $\frac{1224}{16}$).

Described from living specimens which have flowered at Kirstenbosch during the winter months of 1914—1921.

- M. *carolinense*, L. Bolus, epapulosum glaberrimum, caule multo abbreviato, ramis ramulisque dense confertis, reliquis induratis foliorum vetustiorum onustis, ramulis ultimis 4—6-foliatis; folia densa adscendentia connata, vagina circa 0.2 cm. longa, turgide triquetra, supra plana, acuta glauco-viridia, saturate viridi-punctata, ad 2.5 cm. longa, medio 0.6 cm. lata diametroque; flores solitarii 6-meri, ad 4 cm. diam., pedunculis ad 1 cm. longis, ultra folia haud exsertis; calyx turbinatus, segmentis inter se inaequalibus oblongo-lanceolatis acuminatis, 0.7—1.2 cm. longis, 4 membranaceo-marginatis; petala multi-seriata alba, demum apicem versus discolorata, linearia acuta, 0.5—1.8 cm. longa, ad 0.15 cm. lata; staminodia staminaque subdiffusa, filamentis ebarbatis albis, 0.3—0.6 cm. longis, antheris albidis, polline aureo; discus annularis crenulatus; ovarium supra convexum, stylis anguste subulatis, longissime setaceo-acuminatis, aurantiacis, 0.8 cm. longis, ultra stamina exsertis.

Transvaal; Carolina, alt. ca. 5500 ft., *F. A. Rogers*, *C. L. Leipoldt* (National Botanic Gardens, Nos. $\frac{1833}{17}$, $\frac{2819}{17}$).

Described from specimens which flowered at Kirstenbosch in November 1918. The flowers open late in the afternoon.

- M. *ventricosum*, L. Bolus, epapulosum glaberrimum humile, ramis confertis, ad 4—5 cm. longis, reliquis induratis vaginantibus foliorum vetustiorum vestitis, ramulis ultimis 2—4-foliatis, axillis saepe ramuliferis, basi reliquis cinereis chartaceis foliorum vaginatis; folia adscendentia, ad 9 cm. longa, saepissime 4—8 cm. longa, medio 1.3—1.7 cm. lata, 1—1.3 cm. diam., basi connata, vagina ad 1.8 cm. longa, subturgide triquetra, supra medio plana vel levissime convexa, obtusa vel acuta, glauco-viridia vel glauca vel canescentia; flores solitarii 5-meri, ad 5.4 cm. diam., pedunculis 3—3.5 cm. longis, supra medium bracteatis, vagina bractearum ventricosa; calyx clavatus, segmentis inter se inaequilongis, lineari-lanceolatis, acutis vel apiculatis, 1.3—1.8 cm.

longis, tribus anguste membranaceo-marginatis; petala 3—4-seriata, spathulata acuta vel lineari-spathulata acuminata, roseo-purpurea, basin versus purpureo-vittata, 1.5—2.5 cm. longa, 0.2—0.4 cm. lata; stamina subdiffusa vel intima incurva, filamentis ebarbatis roseis, 0.5—1 cm. longis, antheris luteis; discus annularis crenulatus; ovarium supra convexum, stylis late subulatis, abrupte apiculato-acuminatis, 0.3 cm. longis.

Cape Province: South-Western Region; near Clanwilliam, Sep. 1908, *N. S. Pillans*, 1595 (National Botanic Gardens, No. $\frac{47.5}{16}$).

Described from living specimens which have flowered at Kirstenbosch during June and July during the last five years. Through the summer months the plant is completely at rest. About April growth is renewed, and by June the leaves are full-grown, and have split the encasing sheaths of the previous year's leaves apart.

M. Caroli, L. Bolus (§ *Tumidula*). Fruticulus glaberrimus ramis elongatis decumbentibus vel rarius adscendentibus, 0.5 cm. diam. vel ultra, internodiis saepius 1—2 cm. longis, supremis 3 cm. vel ultra longis; folia basi patentia, deinde erecta vel fere erecta, apice saepe recurva, connata per 1—1.2 cm., vagina sulcata more *M. tumiduli*, obtuse 3-quetra, supra plana, acuta, glauco-viridia viridi-punctata, ad 10 cm. longa, saepius 3—5 cm. longa, 0.4—0.5 cm. lata, 0.5—0.6 cm. diam.; flores bi-ternata 5-meri, 2—2.3 cm. diam., alabastris acuminatis, pedunculis 1.5—2.5 cm. longis, omnibus 2-bracteatis; calyx subcrateriformis, segmentis inter se subaequilongis, ovato-lanceolatis acutis, 0.5—0.6 cm. longis, tribus membranaceo-marginatis; petala 2—3-seriata, lineari-spathulata obtusa rosea vittata, vitta roseo-purpurea, 0.5—1 cm. longa, 0.15—0.2 cm. lata; staminodia superne roseo-purpurea cum staminibus inferne albidis, collectis barbatis, 0.3—0.5 cm. longis, antheris luteis; discus annularis crenulatus; ovarium supra convexum, stylis subulatis setaceo-acuminatis, 0.3—0.4 cm. longis.

Cape Province: South-Western Region; Clanwilliam Div., nr Clanwilliam, *L. Pattison* (National Botanic Gardens, No. $\frac{57.0}{14}$). Robertson, *Dr Melle* (*id.* No. $\frac{341.8}{14}$). Montagu Baths, common, Aug. 1920, *M. M. Page* (Bolus Herbarium, No. 16631). Exact locality uncertain, *Charles F. Juritz*.

Described from numerous living specimens which flowered at Kirstenbosch and in Dr Juritz's garden, Three Anchor Bay. The species is named after him.

M. Mallesoniae, L. Bolus. Fruticulus epapulosus glaberrimus, ca. 15 cm. altus, caule basi 1 cm. diam.; rami ramulique adscendentes, juniores 4-goni, internodiis ad 1.7 cm. longis; folia connata per 0.2—0.3 cm., falcata, turgide triquetra, medio supra subconcava obtusissima, apiculata,

apiculo saepe recurvo, atro-purpureo, basin versus angustata, laete viridia, dilute viridi-punctata, marginibus carinaque saepe purpurascens, 1—1.5 cm. longa, 0.5 cm. lata, 0.6 cm. diam.; flores solitarii, 5-meri, ad 2 cm. diam.; calyx subcrateriformis, segmentis inter se inaequalibus, ovatis vel lato ovatis, 0.3—0.5 cm. longis, tribus membranaceo-marginatis; petala 3-seriata lineari-spathulata obtusa roseo-purpurea, ad 0.7 cm. longa, 0.15 cm. lata; staminodia staminaque collecta, filamentis inferne albidis barbatis, 0.4—0.5 cm. longis, antheris luteis; discus annularis crenulatus; ovarium supra concavum, apicem versus leviter convexum, stylis linearibus acuminatis, 0.4 cm. longis; capsula supra 1 cm. diam.

Cape Province: South-Western Region; Ceres Div., hills near Ceres, *J. W. Mathews* (National Botanic Gardens, No. $\frac{373}{17}$). Same locality, *Una Malleon*.

Described from a specimen which flowered at Kirstenbosch, September 1919.

- M. Muelleri*, L. Bolus (§ *Tumidula*), glaberrimum, 50 cm. altum vel ultra, ramis strictis teretibus, cortice tenui cano vestitis, ad 1.3 cm. diam., internodiis 2.5—3 cm. longis, ramulis adscendentibus glauco-viridibus, internodiis 1—6 cm. longis; folia patenti-erecta connata, vagina 0.4—0.5 cm. longa, fere teretia, apicem versus gradatim attenuata, glauco-viridia, 3.5—5 cm. longa, medio 0.5 cm. lata, ad 0.6 cm. diam.; flores tri-ternati 5-meri, 1 cm. diam., pedunculis gracilibus, apicem versus incrassatis, lateralibus bibracteatis, 2—2.5 cm. longis, terminalibus ebracteatis, 0.7—1.2 cm. longis; calyx subcrateriformis, segmentis inter se subaequilongis, lanceolatis vel ovato-lanceolatis, 0.4 cm. longis, tribus membranaceo-marginatis; petala 1-seriata subspathulata obtusa saturate rosea, basin versus rubro-vittata pallidaque, 0.4 cm. longis; staminodia superne saturate rubra, inferne aurantiaca, cum staminibus collecta, dimidio infero barbata; stamina 0.3—0.4 cm. longa, filamentis barbatis, antheris pallidis, polline aureo; discus annularis dentato-crenulatus; ovarium supra conico-convexum, stylis lineari-subulatis acuminatis, 0.3 cm. longis.

South-West Africa: Lüderitzbucht, *Müller* (National Botanic Gardens, No. $\frac{57}{14}$).

Described from living specimens grown at Kirstenbosch where the plants have hitherto not flowered. Last year in July, however, a cutting from one of the specimens flowered in Mr N. S. Pillans' garden at Rosebank.

- M. bifoliatum*, L. Bolus, caule subterraneo ramoso, ramis 2.5—3 cm. longis, ad 0.7 cm. diam., ramulis ultimis confertis binatis bifoliatis, omnino vaginatis; folia ad 3.5 cm. longa, connata, vagina 1.8 cm. longa, ore

pustulata, turgide triquetra, apicem versus divergentia attenuata apiculata, apiculo recurvo, supra plana; flores solitarii, ad 2.4 cm. diam., pedunculo circa 1.2 cm. longo, parte exserta 0.5 cm. longa, 0.3 cm. diam.; calyx disciformis, segmentis 4, acutis, duobus elongatis carinatis compressis, ad 0.8 cm. longis, duobus ovatis, 0.5 cm. longis; petala pauciora 1-seriata linearia obtusa roseo-purpurea, 1 cm. longa; stamina numerosa, filamentis incurvis, deinde e medio patente-recurvis, barbatis roseo-purpureis, ad 0.6 cm. longis; discus annularis, irregulariter crenulatus; ovarium supra globose convexum, stylis 6, basi per tertiam partem longitudinis coalitis, linearibus acuminatis, apicem staminum attingentibus, 0.5 cm. longis.

Cape Province: South-Western Region; *N. S. Pillans* (National Botanic Gardens, No. $\frac{3686}{15}$).

Described from a specimen which flowered at Kirstenbosch in April 1917. The species is quite unlike any other known to me. The plant consisted of some 6 or 7 subaerial branchlets, each of which comprised the withered remains of a pair of leaves with the hardened remains of a peduncle and flower between them, and from the axil of each withered leaf sprang the year's growth, viz. the ultimate branchlet of two leaves ensheathing the stem and a solitary flower, as described above.

M. Peersii, L. Bolus. Fruticulus erectus epapulosus glaberrimus, circa 30 cm. altus, ramis adscendentibus, 15—20 cm. longis, internodiis 2—4 cm. longis; folia patenti-erecta vel alterum paris adscendentia, triquetra acuta glauco-viridia, apice purpurascentia, 2—4 cm. longa, 0.4 cm. lata diametroque, omnia ramulifera, ramulis 2—2.5 cm. longis; flores ternati 5-meri, 3.5—4.4 cm. diam., pedunculis omnibus medio 2-bracteatis, 4—4.5 cm. longis vel lateralibus ad 6 cm. longis; calyx turbinatus, segmentis inter se subaequilongis, ovatis vel ovato-lanceolatis acuminatis, 0.9—1 cm. longis, duobus late brunneo membranaceo-marginatis; petala adscendenti-recurva numerosissima multi-seriata, primo saturate aurantiaca, deinde rubicunda, demum roseo-purpurea, 0.5—1.8 cm. longa; staminodia filiformia, petalis concoloria; stamina conico-collecta, ad 0.6 cm. longa, filamentis pallidis, antheris aureis; glandulae nectariferae semi-lunatae contiguae; ovarium supra planum, stylis 0.5 cm. longis, basi viridibus, dense papillatis, in caudam glabram setaceo-acuminatam purpuream 0.35 cm. longam abeuntibus.

Cape Province: South-Western Region; Clanwilliam Div., Graaff Water, *V. S. Peers* (National Botanic Gardens, No. $\frac{3692}{15}$).

Described from specimens which flowered at Kirstenbosch during September 1917—1919.

M. Kolbei, L. Bolus. Fruticulus erectus, ramis visis ad 24 cm. longis, 0.5 cm. diam., rigidis, vaginis foliorum delapsorum notatis, internodiis saepius

3—5 cm. longis; folia patenti-erecta vel adscendentia, connata, vagina ad 0.5 cm. longa, fere teretia vel supra subplana, obtusa vel subacuta, cum pedunculo calyceque minute denseque papillosa, laete viridia vel seniores pallidiora, 2—3.5 cm. longa, 0.8—0.9 cm. diam.; flores solitarii lateralia 5-meri, ad 6 cm. diam., pedunculis ad 2.5 cm. longis, 0.5 cm. diam., in calycem gradatim abeuntibus; calyx turbinatus, segmentis valde inaequalibus, duo longioribus ad 2.3 cm. longis, ceteris 1.1—2 cm. longis, tribus latissime membranaceo-marginatis; petala flaccida pluri-seriata, anguste linearia, albis, ad 2.5 cm. longa, circa 0.1 cm. lata; stamina diffusa, ad 0.5 cm. longa, filamentis albidis barbatis, antheris pallidis; nectarium forsitan e fossis minutis intra lobos ovarii compositum; ovarium supra convexum, stylis tomentosis subulatis acuminatis, 0.3 cm. longis.

Cape Province; near Vanrhynsdorp, fl. Oct. 1917, *F. C. Kolbe* (National Botanic Gardens, No. ²³⁸⁸₁₇).

Described from fresh material consisting of four branches given by Monsignor Kolbe.

- M. *Britteniae*, L. Bolus, epapulosum glaberrimum, ramis rigidis elongatis, 20—30 cm. longis, 0.3 cm. diam., internodiis 2—2.5 cm. longis, patentibus, apicem versus ad terram decurvis, latere superiore ramulos floriferos 4—5-nodosos, 4—9 cm. longos emittentibus, ramulis saepius defoliatis, ramulis ultimis 2—4-foliatis; folia adscendentia, basi vix connata, turgide triquetra, abrupte acuta, minute apiculata, glauco-viridia, saturate viridi-punctata, 1—1.6 cm. longa, medio 0.4 cm. lata diametroque; flores ternati, ad 2.8 cm. diam., pedunculis omnibus infra medium 2-bracteatis, 1.3—1.7 cm. longis, fructiferis ad 4 cm. longis; calyx globose turbinatus, segmentis 5, inter se subaequalibus, ovatis vel ovato-lanceolatis, 0.6 cm. longis, 3 vel etiam 4 membranaceo-marginatis; petala 2—3-seriata spathulata saepius emarginata, roseo-purpurea, ultra medium purpureo-vittata, 0.7—1.2 cm. longa, apice 0.2 cm. lata; stamina subdiffusa, filamentis barbatis, superne purpureis, 0.4—0.5 cm. longis, antheris pallidis; discus annularis crenulatus; ovarium supra conico-convexum, stylis 10, lineari-subulatis acuminatis, 0.5 cm. longis; capsula subglobosa 10-sulcata, medio 0.9 cm. diam.

Cape Province: South-Eastern Region; near Grahamstown, *L. Britten* (Botanical Survey, No. 1802; Bolus Herbarium, No. 17142). *C. F. Juritz*, 77.

Described from living specimens received from the Director of the Botanical Survey, and from specimens from a plant which flowered in Dr Juritz's garden, Three Anchor Bay, in September 1921.

- M. *sociorum*, L. Bolus, epapulosum glaberrimum, ramis elongatis reptantibus, 25 cm. longis vel ultra, 0.2 cm. diam., internodiis curvatis, 2—3 cm.

longis, ramulis floriferis erectis, 2—4 cm. altis; folia adscendentia vel subfalcata, basi vix connata, turgide triquetra vel fere semi-teretia, supra leviter concava, acuta, basin versus parum angustata, glaucoviridia, 1—2.5 cm. longa, ad 0.3 cm. lata diametroque; flores solitarii 5-meri, 3—3.5 cm. diam., pedunculis 0.6—2 cm. longis; calyx clavatus, segmentis ovatis vel lanceolatis, 0.3—0.5 cm. longis, tribus late membranaceo-marginatis; petala 2—3-seriata spathulata, acuta vel obtusa, rosea, basin versus roseo-purpurea, ad 1.8 cm. longa, ad 0.25 cm. lata; staminodia apice recurva, superne roseo-purpurea; stamina conico-collecta, filamentis inferne pallidis barbatis, superne luteis, ad 0.4 cm. longis, antheris aureis; discus annularis, inaequaliter grosseque crenulatus; ovarium supra leviter concavum, stylis lineari-subulatis acuminatis, 0.4 cm. longis.

Cape Province: South-Western Region; Darling, Sep. 1917, W. Peacock and L. Bolus (National Botanic Gardens, No. $\frac{1666}{17}$). Near Tulbagh, Sep. 1917, W. Peacock and L. Bolus (*id.* No. $\frac{1922}{17}$). Riversdale, J. La Grange (*id.* No. $\frac{4584}{14}$).

Described from living specimens which flowered freely at Kirstenbosch during September and October for several years.

- M. cinctum, L. Bolus, epapulosum glaberrimum, ramis decumbentibus elongatis, 20 cm. longis vel ultra, internodiis 1—2 cm. longis, ramulos floriferos 2—6 cm. longos emittentibus; folia adscendentia, apice uncinato-recurva, triquetra, supra medio plana, acuta, marginibus carinaque saepius minute serrulatis, glaucoviridia, apicem versus rufescentia, ad 2 cm. longa, 0.5 cm. lata, 0.6 cm. diam.; flores saepissime solitarii, 5-meri, 2—2.2 cm. diam., pedunculis gracilibus 0.7—1.2 cm. longis (partem ultra folia suprema vel bracteas exsertam metiente); calyx subcrateriformis, segmentis inter se subaequilongis, oblongis, abrupte apiculato- vel setaceo-acuminatis, tribus membranaceo-marginatis, 0.4 cm. longis; petala 1-seriata spathulata obtusa rosea, marginibus purpureo-cincta, 0.9—1 cm. longa, vix ad 0.2 cm. lata; staminodia staminaque collecta, filamentis omnibus barbatis roseo-purpureis, 0.2—0.4 cm. longis, antheris pallidis; discus annularis crenulatus; ovarium supra elliptico-convexum, stylis crassis, late subulatis, acuminatis luteis, 0.2 cm. longis.

Cape Province: South-Western Region; near Riversdale, N. S. Pillans, 2016 (National Botanic Gardens, No. $\frac{492}{16}$).

Described from specimens which flowered freely at Kirstenbosch during August and September.

- M. excavatum, L. Bolus, papillosum, papillis oblongis nitentibus, ramosum, ramis adscendentibus, ad 20 cm. longis, ad 0.5 cm. diam., internodiis 1—1.4 cm. longis, vel senioribus ad 3 cm. longis; folia adscendentia vel

patentia, spathulata, supra excavata, apice rotundata, crassa, laete viridia, demum lutescentia, 1—1.5 cm. longa, apice ad 0.5 cm. lata, saepissime alternatim disposita; flores solitarii, ultimos ramulos terminantes, 5-meri, 1.5 cm. diam., pedunculis ab calyce vix distinctis, 0.5—1 cm. longis; calyx lineari-clavatus, segmentis inter se valde inaequalibus, duobus foliaceis, ad 0.7 cm. longis, ceteris minoribus, 0.3—0.4 cm. longis, tribus late membranaceo-marginatis; petala pauciora 1-seriata linearia obtusa, saturate lutea, 0.6 cm. longa, 0.1 cm. lata; stamina pauciora diffusa, filamentis ebarbatis pallidis, ad 0.4 cm. longis, antheris pallidis; discus non visus; ovarium supra conico-convexum, stylis subulatis luteis, 0.1 cm. longis.

Cape Province: Upper Region; near Beaufort West, *J. W. Mathews* (National Botanic Gardens, No. $\frac{2392}{172}$).

Described from specimens which flowered at Kirstenbosch in October 1917.

M. integrum, L. Bolus (§ *Uncinata*). Fruticulus glaberrimus rigidus, 20—30 cm. altus, caule basi ad 1.3 cm. diam.; rami ramulique adscendentes vel erecti, 6—15 cm. longi, 0.2 cm. diam. vel juniores ad 0.4 cm. diam.; folia adscendentia uncinato-recurva connata, vagina saepius 0.5 cm. longa, medio fere semi-teretia, apicem versus triquetra, supra plana, glauco-viridia, marginibus cum carina integra rubescentibus, parte libera 0.5—0.8 cm. longa, medio 0.3 cm. lata; flores solitarii, ad 1.8 cm. diam., pedunculis brevissimis inclusis; calyx turbinatus, segmentis 5, inter se inaequilongis, lineari-lanceolatis acuminatis, 0.5—0.8 cm. longis, duobus carinatis, tribus membranaceo-marginatis; petala multiseriata spathulata, obtusa vel acuta, basin versus papillata, saturate roseo-purpurea, 0.4—0.7 cm. longa, ad 0.15 cm. lata; staminodia staminaque rigide conferta modo sectionis “*Bracteata*,” staminodiis exterioribus teretibus, apice recurvis, inferne papillatis, purpureis, interioribus albidis, filamentis barbatis, antheris luteis; discus haud visus; ovarium supra concavum, stylis 8 subulatis minutis, vix 0.1 cm. longis; capsula leviter convexa, 8-sulcata, ad 1 cm. diam.

Cape Province: South-Western Region; Robertson Div., Ashton, fl. Nov. 1921, *F. A. Rogers* (Bolus Herbarium, No. 17175).

Described from ample living material sent by the Venerable *F. A. Rogers*.

M. dependens, L. Bolus, glaberrimum, ramis elongatis decumbentibus, teretibus vel junioribus tetragonis, ad 0.3 cm. diam., internodiis 1—5.5 cm. longis; folia patentia vel recurvata, basi connata leviterque gibbosa, medio teretia vel fere teretia, acuta, minute papillosa, nitentia, obscure albo-punctata, laete viridia, subtranslucentia, saepius 3.5—5.5 cm. longa, 0.3—0.4 cm. diam.; flores 3-nati vel abortione 1—2-nati, ad 6 cm. diam.,

pedunculis omnibus bracteatis saepius 3—4.5 cm. longis, bracteis 1—2.4 cm. longis; calyx turbinatus, pellucide punctatus, segmentis inter se valde inaequalibus acutis, 0.5—1.2 cm. longis, tribus ampliate membranaceo-marginatis; petala pluri-seriata linearia, basi imino angustata, saepissime inaequaliter dentata, lilacina, exteriora ad 2.5 cm. longa, 0.2 cm. lata, interiora 0.8—1.1 cm. longa, vix 0.1 cm. lata; staminodia staminaque collecta, filamentis albis, omnibus basi barbatis, 0.2—0.4 cm. longis, antheris minutis albidis, polline luteo; discus annularis crenulatus atro-viridis; ovarium supra planum vel demum leviter convexum, 5-lobum, 0.6 cm. diam., stylis late subulatis setaceo-acuminatis, 0.2 cm. longis.

Cape Province: South-Western Region; Robertson Div., hanging over damp cliffs in Cogman's Kloof and in the Cave, near Montagu Baths, fl. Oct. 1921, *M. M. Page* (Bolus Herbarium, No. 17156).

A very beautiful plant whose mauve or lilac petals are rare in the genus.

M. uniflorum, L. Bolus, epapulosum glaberrimum ramosum, ramis elongatis, decumbentibus vel adscendentibus, saepe inter frutices scandentibus, tetragonis, ad 40 cm. longis, ad 0.4 cm. diam., internodiis saepius 3—4.5 cm. longis; folia patenti-incurva vel patentia vel decurva, apicem versus incurva, basi connata leviterque gibbosa, teretia obtusa, laete viridia, 2—2.8 cm. longa, medio 0.3—0.4 cm. diam.; flores solitarii 5-meri, 2—2.4 cm. diam., pedunculis ebracteatis gracilibus, 0.7—3.3 cm. longis; calyx turbinatus, apice tubi subconstrictus, segmentis inter se inaequilongis, ovato-oblongis, 0.3—0.5 cm. longis, tribus membranaceo-marginatis; petala 2—3-seriata lineari-spathulata acuta roseo-purpurea, 0.7—1.1 cm. longa, ad 0.2 cm. lata; staminodia staminaque collecta, filamentis 0.3—0.4 cm. longis, interioribus dense barbatis; discus annularis crenulatus; ovarium supra convexum, stylis subulatis, longe caudato-acuminatis, 0.5 cm. longis.

Cape Province: Karroo Region; Beaufort West Div., Klipbank, May 1921, *F. A. Rogers* (Bolus Herbarium, No. 17066).

Described from ample living material sent by the Venerable F. A. Rogers.

The main axis of each shoot terminates in a slender peduncle, and from the axil of each of the last pair of leaves normally arises a robust branch which carries on the growth. I cannot recall any previously described species with exactly this method of flowering.

R. Schlechter, 11334, from Concordia, Little Namaqualand, September 19, 1897, appears to be this species.

M. induratum, L. Bolus (§ *Uncinata*). Humile, caule prostrato rigido, 0.5 cm. diam., ramis confertis, ramulis ultimis 4-foliatis, internodiis brevissimis

inclusis; folia adscendentia connata, vagina ad 3 cm. longa, triquetra, medio supra concava, subspinose apiculata, carina infra apicem rigide 1-denticulata, glauco-viridia, saturate viridi-punctata, parte libera 0·8—1 cm. longa, medio ad 0·3 cm. lata; flores solitarii 5-meri, 1·8—2 cm. diam., pedunculis gracilibus, basi 2-bracteatis, saepius 1·5 cm. longis, accrescentibus ad 2·5 cm. longis vel ultra, induratis vel subspinescentibus; calyx turbinatus, segmentis inter se subaequilongis, lanceolatis acutis, 0·4—0·5 cm. longis, 3—4 membranaceo-marginatis; petala 1—2-seriata lineari-spathulata acuta rosea, 0·7—0·8 cm. longa, vix 0·1 cm. lata; staminodia staminaque collecta, filamentis basi parce barbatis albidisque, superne roseis, ad 0·4 cm. longis, antheris luteis; glandulae nectariferae fere discretae, crenulatae; ovarium supra globose convexum, profunde lobatum, stylis erectis, demum conspicue radiantibus, lineari-subulatis, longe acuminatis, luteis, ad 0·45 cm. longis.

Cape Province: Karroo Region; Steytlerville, anno 1905, *Eustace Pillans* (Pillans, No. 1277; National Botanic Gardens, No. $\frac{383}{16}$). Beaufort West, Oct. 1917, *J. W. Mathews* (National Botanic Gardens, No. $\frac{2323}{17}$). Upper Region; Steynsburg, *H. de Villiers* (*id.* No. $\frac{266}{16}$).

Described from living material which has flowered at Kirstenbosch for several years during October and November.

- M. viatorum*, L. Bolus. Fruticulus epapulosus glaberrimus, 15 cm. altus vel ultra, ramosus, ramis ramulisque patentibus vel saepius adscendentibus, ultimis floriferis 4—9 cm. longis, 0·2 cm. diam.; folia adscendentia vel erecto-patentia, rarius recurva, connata, vagina 0·2—0·3 cm. longa, triquetra obtusa aristulata, 1—2 cm. longa, 0·4 cm. diam.; flores solitarii, 2·3 cm. diam., pedunculis 3—4 cm. longis, medio vel supra 2-bracteatis; calyx clavatus, segmentis 5—6, inter se subaequalibus, lanceolatis acutis, 0·6—0·7 cm. longis, duobus anguste membranaceo-marginatis; petala 2—3-seriata spathulata, obtusa vel acuta, rosea, 1 cm. longa, apice 0·1—0·15 cm. lata; stamina erecto-patentia, 0·2—0·4 cm. longa, filamentis infra medium barbatis; discus annularis crenulatus; ovarium supra conico-convexum, 0·5 cm. diam., stylis 5—6, erecto-patentibus lineari-subulatis setaceo-acuminatis, 0·45 cm. longis.

Western Region: Namaqualand; between Bitterfontein and Stinkfontein, Dec. 1910, *H. H. W. Pearson* (Percy Sladen Memorial Expedition, No. 5575).

Described from living specimens which flowered in Mr N. S. Pillans' garden, Rosebank, near Cape Town.

- M. solidum*, L. Bolus, caule brevi, 2 cm. alto, 0·5 cm. diam., ramis decumbentibus, apicem versus adscendentibus, rigidis, 15—20 cm. longis vel rarius ad 40 cm. longis, internodiis 1·5—2 cm. longis, reliquis induratis

vaginantibus foliorum onustis, ramulis ultimis floriferis saepius 2-foliatis, 3—5 cm. longis; folia adscendentia connata, vagina 0.3—0.5 cm. longa, fere teretia, supra plana, obtusa laevisissima glaucoviridia, saturate viridi-punctata, ad 2.5 cm. longa, 0.7 cm. lata; flores ternati vel bi-ternati vel rarius abortione solitarii, 5-meri, ad 2 cm. diam., pedunculis 1—2.5 cm. longis, lateralibus bibracteatis, bracteis vaginantibus, parte libera ad 0.3 cm. longa; calyx subcrateriformis, segmentis inter se subaequilongis ovato-lanceolatis acutis, 0.4—0.5 cm. longis, tribus membranaceo-marginatis; petala 1—2-seriata lineari-spathulata acuta roseo-purpurea, 0.7—0.8 cm. longa; staminodia staminaque collecta, filamentis medio barbatis; roseis, 0.3—0.5 cm. longis, antheris pallidis; discus annularis crenulatus; ovarium convexum, stylis subulatis acuminatis luteis, 0.2 cm. longis.

Cape Province: Vanrhynsdorp Div., Nieuw Rust, Dec. 1911, *N. S. Pillans*, 2421 (National Botanic Gardens, No. $\frac{487}{16}$).

Described from living specimens which have flowered at Kirstenbosch for several years.

M. Juritzii, L. Bolus (§ *Acinaciformia*). Folia adscendentia vel patentia, basi connata, triquetra, valde compressa, supra medio plana, lateribus leviter canaliculata, glauco-viridia, sat mollia, ad 8 cm. longa, medio ad 0.9 cm. lata diametroque; flores solitarii, ad 6 cm. diam., saepius circa 5.5 cm. diam., pedunculis 2 cm. longis; calyx turbinatus, segmentis 5, inter se inaequalibus, acutis, duobus foliis simillimis, ad 2.5 cm. longis, tribus lineari-lanceolatis membranaceo-marginatis, ad 1.6 cm. longis; petala circa 2-seriata linearia obtusa, laete roseo-purpurea, basin versus alba, 2—2.5 cm. longa, ad 0.2 cm. lata; stamina collecta vel exteriora subdiffusa, filamentis albis, basi barbatis, 0.3—0.7 cm. longis, antheris pallidis, polline luteo; discus annularis, minute crenulatus, inconspicuus; ovarium supra concavum, in medio vero elevatum, stylis 10, radiatis subulatis, 0.2 cm. longis; fructus subglobosus, 1.7—2 cm. longus, 2 cm. diam.

Cape Province: exact locality uncertain, *C. F. Juritz*, 23, National Botanic Gardens, No. $\frac{837}{19}$. Natal; Durban, The Bluff, fl. June 1920, *N. S. Pillans* (Bolos Herbarium, No. 15196).

Described from several specimens which flowered in Dr Juritz's garden and at Kirstenbosch.

M. Mellei, L. Bolus (§ *Acinaciformia*). Folia patenti-adscendentia, basi connata, subacinaciformia glauca vel glauco-viridia, 7—8 cm. longa, ad 1 cm. lata, ad 1.5 cm. diam.; flores solitarii, 5.5 cm. diam., pedunculis 4.5 cm. longis, supra medium 2-bracteatis, bracteis 2.5 cm. longis; calyx clavatus, lateraliter compressus, 2.2 cm. longus, 1.9 cm. diam., segmentis 5, inter se valde inaequilongis, late ovatis, acuminatis cari-

natis, 1.1—2.3 cm. longis, duobus latissime membranaceo-marginatis; petala 2—3-seriata linearia, acuta vel obtusa, rosea vel pallide rosea (almost shell-pink), ad 2 cm. longa, vix ad 0.2 cm. lata; stamina subdiffusa, filamentis interioribus basin versus barbatis, exterioribus glabris, 0.6—0.7 cm. longis; discus inconspicuus annularis, minute crenulatus; ovarium supra leviter convexum, stylis 10, lineari-subulatis, longe acuminatis, 1.1 cm. longis, ultra stamina bene exsertis; fructus clavatus, 3 cm. longus, 2 cm. diam.

Cape Province: South-Western Region; Robertson, *Dr Melle* (National Botanic Gardens, No. $\frac{3275}{14}$).

Described from living specimens which have flowered for several years at Kirstenbosch during September.

The long styles and the pale rose or almost shell-pink colour of the petals distinguish this from any other species in this section known to me.

M. Muirii, L. Bolus (§ *Acinaciformia*). Folia fere erecta, adscendentia vel late patentia, juniora apice incurva, basi connata, saepius viridia modo *M. edulis*, 5.5—7 cm. longa, 0.6 cm. lata, ad 0.7 cm. diam.; flores 6.5—9 cm. diam., pedunculis medio vel supra medium 2-bracteatis, saepius 3—4 cm. longis; calyx globose turbinatus, ad 2.5 cm. diam., segmentis inter se valde inaequalibus carinatis, tribus membranaceo-marginatis, 1.3—2 cm. longis, fructu ad 2.5 cm. longis; petala circa 3-seriata linearia obtusa, basin versus angustata, roseo-purpurea, ad 3 cm. longa, 0.2 cm. lata; stamina erecta vel subdiffusa, filamentis basin versus barbatis roseis superne pallidis, ad 1 cm. longis, antheris luteis; discus vix visus; ovarium supra concavum, stylis 15, subulatis acuminatis, 0.4 cm. longis; fructus 2—2.5 cm. longus, apice 1.8—2.2 cm. diam., basi subrotundus, 2—2.5 cm. longus, apice 1.8—2.2 cm. diam., basi subrotundatus, circa 1.2 cm. diam.

Cape Province: South-Western Region; Riversdale Div., Zoutpan, near Albertinia, fl. Oct., *Dr John Muir*, 759 (National Botanic Gardens, No. $\frac{1516}{14}$). Bo'plaats, fruiting specimens, Dec. *id.* 2423.

Described from several living specimens received from Dr Muir who pointed out to me that this species was entirely distinct from *M. edule* and another which is known as "t'gaukum" in the Riversdale Div. The latter has flowered and fruited at Kirstenbosch and appears to be a very good species, hitherto undescribed. Careful drawings are being made of as many of the forms as are available, and I hope to complete a description of the "t'gaukum" at its next flowering period.

Dr Muir writes that this species (*M. Muirii*, mihi) "is called 'Zuur vijgen' or 'sour figs.' Only eaten when dried. They are collected when they have dried on the plant. These dried ones make a very nice jam

and are exported from here to Cape Town and elsewhere in great quantities in sacks. They cost about 2*d.* per lb. here."

The narrow leaves serve to distinguish this species at sight from the rest of the section.

Aristea ensifolia, Muir. [Irideae-Sisyrinchieae-Aristeae.] Herba glaberrima, rhizomate radículas multas fibrosas tenues emittente, ad 58 cm. alta; folia basalia disticha, circiter 5, ensiformia acuta, modice rigida, basi vaginantia, nerviis multis conspicuis, paullo angustata inferne, in medio parte 1·3—2 cm. lata, 30—55 cm. longa; caulis simplex, valde anceps, strictus vel sub-flexuosus superne, 0·6 cm. diametro, 20—58 cm. altus (cum inflorescentia), 2—3 foliis reductis ornatus, foliis reductis, viridibus rigidis lanceolato-acuminatis, 0·6—25 cm. longis, sursum gradatim attenuatis; inflorescentia laxe racemosa, 10—20 cm. longa, e spathis circiter 5, bifloris composita, spathis bractea magna viride rigida integra lanceolato-acuta, ad 7 cm. longa subtensis; spathae valvae 0·9—1·8 cm. longae, superiores minores, basi dilute virides, apicem versus dilute brunneae, angustissime membranaceo-marginatae, lanceolato-acutae; pedicelli 0·9—1·3 cm. longi, exteriores longiores; perianthii segmenta cyanea speciosa, mox marcescentia, exteriora obovata obtusa, 1·4 cm. longa, 0·8 cm. lata, subtus pallido-carinata, interiora 1·4 cm. longa, 0·5 cm. lata, subtus viridicarinata; perianthii tubus cylindricus, 0·2 cm. longus; stamina basi segmentorum interiorum inserta, antheris erectis, filamentis 0·5 cm. longis; ovarium leviter incurvum, triquetrum, lateribus uni-nervatis; stylus cylindricus 0·7 cm. longis, ramis brevibus rotundatis planis patentibus; capsula triquetra, ad 3·5 cm. longa, 3-locularis, pedicellis 2 cm. longis; seminibus crebris, superpositis angulatis, saturate brunneis.

Cape Colony: South-Western Region; Riversdale Div., near Albertinia, in rich black wet soil, alt. 30·5 met., fl. Oct.—Nov., *Dr John Muir*, 2458.

Watsonia Versfeldii, Mathews and L. Bolus (Irideae-Ixieae), *W. roseae* affinis sed floribus multo majoribus, segmentis pro portione longioribus angustioribusque, staminibus arcuatis, ceterisque facile distinguitur.

Erecta, ad 1·65 met. alta; cormus depresso globosus, 2·5 cm. longus, 5 cm. diam., tunicis e fibris, inferne tenuibus, superne crassioribus, compositis; folia radicalia 7, ensiformia, ad 85 cm. longa, 5 cm. lata, infimo superioribus parum longiore, nervis inconspicuis, caulina 2, haud ventricosa, breviter imbricata, inferiore ad 41 cm. longo, vagina 15 cm. longa, superiore 13 cm. longo, saepissime sine parte libera; inflorescentia 87 cm. longa, sublaxe multiflora, internodiis 1·3—2 cm. longis, infra medium ramosa, ramis erectis vel suberectis; bractaeae

obtusae, dimidio superiore membranaceo, 1.6 cm. longae, bracteolis fere ad apicem coalitis, parte libera 0.2 cm. longa, bracteis aequilongis; alabastrum acuminatum; perianthium laete roseum, tubo intus purpureo-vittato, ad 10 cm. longum, primo fere erecto, demum decurvato, parte filiformi 2.6 cm. longa, vix 0.02 cm. diam., parte cylindracea 3 cm. longa, ore 0.8 cm. diam., segmentis subdependentibus obtusis, 4.4 cm. longis, exterioribus oblongis, 1.2 cm. latis, interioribus crispulatis, 1.5 cm. latis; stamina arcuata, ad dimidium segmentorum attingentia, filamentis 2.5 cm. longis, antheris albidis, mox purpurascentibus, 1.1 cm. longis; stylum stamina parum excedens, ramis 0.5 cm. longis, stigmatibus 0.25 cm. longis; capsula cylindrica, ad 2.5 cm. longa, saepius 2—2.3 cm. longa, 0.8—1 cm. diam., seminibus 1—1.5 cm. longis, alis ad 0.8 cm. longis.

Cape Province: South-Western Region; Piquetberg Div., mountains near Piquetberg, *W. Versfeld* (National Botanic Gardens, No. $\frac{2671}{16}$).

Allied to *W. rosea*, Ker, but is easily distinguished by the much larger flowers, by the proportionately longer and narrower segments, the arcuate stamens, and by other characters.

Described from several living specimens which have flowered freely at Kirstenbosch during November for the last five years.

Watsonia Versfeldii, var. *alba*, Mathews and L. Bolus, floribus albis. Same locality and collector (National Botanic Gardens, No. $\frac{2671}{16}$).

W. bulbillifera, Mathews and L. Bolus, *W. Merianae* affinis sed caule elatiore robustioreque, foliis latoribus, inflorescentia laxiore, praecipueque foliis superioribus vaginantibus bracteisque bulbilliferis differt.

Glaberrima stricta, ad 2.1 met., saepius circa 1.8 met. alta, caule 0.9—1.1 cm. diam.; cormus subplacentiformis, 7 cm. longus, 4 cm. diam., tunicis e fibris crassis compositis; folia radicalia 5—6, ensiformia, 52—63 cm. longa, ad 6 cm. lata, caulina 3—5, vagina ad 23 cm. longa, parte libera ad 14 cm. longa, suprema ad 6 cm. longa; inflorescentia 49.5—64 cm. longa, laxa, internodiis 3—4 cm. longis, ramosa, ramis parum divergentibus, inferioribus ad 53 cm., superioribus ad 8 cm. longis, paucis 1-fl. ramis superne additis; bractee demum dimidio superiore membranaceae, 2.2—1.7 cm. longae; bracteolae omnino coalitae, bracteis aequilongae; perianthium erecto-patens rubro-testaceum, extus pallidius, margine saturata, tubo intus albo-vittato, 6.7 cm. longum, apice explanato 3.4 cm. diam., tubo inferne filiformi, fere erecto, 1.8 cm. longo, 0.3—0.5 cm. diam., superne cylindraceo patenti, ad 2.5 cm. longo, ore 1 cm. diam., segmentis vix patentibus concavis, 2.4 cm. longis, exterioribus oblongis, 1.3 cm. latis, interioribus obovatis, basi subauriculatis, 1.4 cm. latis; stamina arcuata, filamentis 3.2 cm. longis, antheris exsertis atro-purpureis, 1 cm. longis, polline pallide

purpureo; stigmata demum exserta; capsula cylindracea, ad 3 cm. longa, 0.6 cm. diam., rarissime producta; bulbillae oblique globosae rostratae, ad 2.4 cm. longae, basi 1.5 cm. diam., in fasciculis (ad 28 in fasciculo) in axillis foliorum superum caulinorum bractearumque, fere ad apicem axis floriferi, dispositae.

Cape Province: South-Western Region; Paarl Div., Joostenberg (National Botanic Gardens, No. $\frac{707}{13}$).

Allied to *W. Meriana*, Mill., but differs in having a taller and more robust stem, broader leaves, laxer inflorescence, and especially by the upper sheathing leaves and bracts being bulbilliferous.

Described from many living specimens which have flowered freely in the National Botanic Gardens for several years. The habit of producing cormlets is rare in the genus, occurring only in two or three species, and in none are the cormlets so numerous as in this. The few capsules that form (usually with one or more cormlets in the same axil) contain very few (1 or 2) seeds which are perfect.

W. tabularis, Mathews and L. Bolus, *W. bulbilliferae* affinis, sed bulbillis abeuntibus, foliis longioribus vaginis multo brevioribus, floribus majoribus, perianthii segmentis interioribus longioribus quam exterioribus differt.

Erecta, fere ad 2 met. alta; folia radicalia 4—5, ad 1.1 met. longa, 4.8 cm. lata, vix equitania, vagina brevissima, ad 12 cm. longa, nervis, praeter medium prominentem, praecipue inconspicuis, marginibus haud incrassatis subpellucidis, caulina 2—3, infimo immo basi caulis oriente, 18 cm. longo, vagina 13 cm. longa, ceteris spathiformibus, 22 cm. longis; spathae 2—3, 21—8 cm. longae; spica subdisticha, floribus convergentibus, 2—3-ramosa, parte terminali circa 24-fl., ad 71 cm. longo, axi florifero 48 cm. longo, ramis gracilibus, 8—14-fl., ad 57 cm. longis; bracteae ovato-oblongae, 1.8—1 cm. longae, bracteolis paullo longioribus, ad apicem fere coalitis; flores patentes, mox nutantes, perianthii tubo corallino, 4.3 cm. longo, apice 1 cm. diam., segmentis exterioribus subpatentibus oblongis obtusis, basi parum angustatis, extus corallinis, intus salmoneis, ad 3.1 cm. longis, 1.6 cm. latis, interioribus obovatis, 3.5 cm. longis, 2.3 cm. latis, salmoneis, postico porrecto subconcavo; stamina arcuata, filamentis 4.6 cm. longis, antheris atrocyaneis, 1.4 cm. longis, polline albedo; stylus stamina paullo excedens, ramis 0.8 cm. longis, stigmatibus gracillimis, 0.4 cm. longis; capsula cylindracea, basin versus angustata, ad 3.5 cm. longa, apice 0.8 cm. diam., seminibus 1—1.3 cm. longis, alis 0.4—0.6 cm. longis.

Cape Province: South-Western Region; Cape Div., Table Mountain, upper slopes and lower plateau frequent, less frequent nearer the summit, fl. Dec.—Feb.: lower eastern slopes at Kirstenbosch, in

swampy ground, and Klassenbosch Valley, *J. W. Mathews* (Bolus Herbarium, No. 15193).

Allied to *W. bulbillifera*, Mathews and L. Bolus, but differs in not having bulbils, and in having longer leaves with much shorter sheaths, and larger, differently coloured flowers of which the inner perianth-segments are longer than the outer ones.

Described from several living specimens which have flowered during December at Kirstenbosch for the last four or five years.

Gladiolus Mostertiae, L. Bolus, *G. Pritzellii* forsitan affinis, sed foliis pubescentibus, perianthii colore, tubo canaliculato intus, segmento antico concavo, ceterisque distinguitur.

Erectus, ad 25 cm. altus; cormus globosus, ca. 1 cm. longus, 1.1 cm. diam., tunicis e fibris tenuissimis brunneis compositis; folia radicalia 4, duo vaginiformibus, 1.4—2.9 cm. longis, tertio producto, prominenter 3-nervato, lineari, longe attenuato, pubescente, 24.5 cm. longo, vagina 3 cm. longa, 0.4 cm. lato, quarto 16.5 cm. longo, vagina 8 cm. longa, caulina duo pubescentia, inferiore 8.3 cm. longo, vagina 4 cm. longa, superiore 3.9 cm. longo, vagina 2 cm. longa; pedunculus glaber, 9.4 cm. longus, e basi ramosus; flores 5 subsecundi, ore 1.8 cm. longi, 1.4 cm. lati; bracteae oblongae obtusae glabrae, 1.4—1 cm. longae, ad 0.5 cm. latae, bracteolis ad 1.1 cm. longis, fere ad apicem coalitis, parte libera 0.1 cm. longa; perianthium subtransparens, laete saturateque carneum, tubo bracteae subaequilongo, postice 0.6 cm., antice 1.5 cm. longo, intus 3-canaliculato, segmentis apiculatis, exterioribus lateralibus apicem versus recurvatis, oblique rhomboideo-orbicularibus, postice 1.4 cm., antice 0.6 cm. longis, 1 cm. latis, segmento inferiore sub-orbiculari concavo, 0.9 cm. longo, segmento interiore postico porrecto obovato-oblongo galeato, 2 cm. longo, 1.2 cm. lato, ceteris unguiculatis, unque 0.5 cm. longo, carneo, saturatis maculis notato, lamina sub-orbiculari, 0.6 cm. longa, albida, medio macula viridi-lutea notata; filamenta 1.6 cm. longa, antheris 0.5 cm. longis; stylus 2.1 cm. longus, stigmatibus 0.3 cm. longis.

Cape Province: Western Region; Vanrhynsdorp Div., Cloudskraal, *Miss Lettie Mostert* (National Botanic Gardens, No. $\frac{1609}{20}$).

A very distinct species, the nearest ally being, perhaps, *G. Pritzellii*, Diels. The pubescent leaves, colour of the perianth, channelled tube, concave anticus segment, as well as other characters readily distinguish it.

Described from one living specimen which flowered at Kirstenbosch, December 1921.

Restio paludosus, Pillans, *R. tenuissimo* affinis, sed caulibus minus flexis, spiculis semper 1-floris, et perianthio semper completo differt.

Stems caespitose, clothed at the base with chartaceous, brown scales, erect, straight or slightly curved, sparingly branched or less often simple, slender, smooth, pale green, 5—15 cm. high, .5—75 mm. in diam.; leaf-sheaths tightly convolute, oblong, obtuse, with a subulate or often foliaceous mucro, coriaceous, membranous along the upper margins, striate below the apex, 5—10 mm. long; male inflorescence not seen; female inflorescence linear-spiciform, with 1—5 spikelets, 10—15 mm. long; spathes tightly clasping the spikelets, oblong, obtuse, with a comparatively stout mucro, coriaceous, membranous along the upper margins, 3.5—4 mm. long; spikelets sessile, linear, 1-flowered, 4.5—5.5 mm. long; bracts 2, closely convolute, oblong-lanceolate, acute, cartilaginous in the lower half, membranous in the upper, about 4 mm. long; perianth sessile, linear, terete, 3—4 mm. long; segments closely convolute, lanceolate, acuminate, dorsally rounded, membranous, glabrous; the inner distinctly shorter than the outer; ovary oblong, 2-celled; styles 2, united nearly half their length, corkscrew-twisted in their upper part.

Cape Province: South-Western Region; Cape Div.; marsh on plateau north-west of Paul's Berg, Pillans, 4145, ♀!

Allied to *R. tenuissimus*, Kunth, but differs in having the stems less bent, the constantly 1-flowered spikelets and the complete perianth.

Dovea Marlothii, Pillans, *D. aggregatae* valde affinis, sed inflorescentia paniculato-cymosa, spathis brevioribus, spiculis majoribus distinguatur.

Stems caespitose, erect, simple, rigid, finely wrinkled, 6—7 dm. high, 2—2.75 mm. in diam. at the middle; leaf-sheaths soon falling, oblong, acute, mucronate, coriaceous, striate, chestnut-brown, 2.5—3.5 cm. long; male inflorescence paniculate-cymose, oblong, densely many-flowered, 3—4 cm. long; spathes subpersistent, oblong, acute, mucronate, coriaceous, smooth, chestnut-brown, about 1 cm. long; spathellae inconspicuous, ovate; spikelets ovate, compressed, 2—5-flowered, 4—6 mm. long; barren bracts 3—4, ovate, smaller than the fertile; fertile bracts closely convolute, broadly ovate, acute, cartilaginous, minutely pitted on the upper part, 3 mm. long; perianth sessile, oblong, rounded on the dorsal side and flattened on the ventral side, 4—4.5 mm. long; outer segments ovate, subacute, cartilaginous; the lateral slightly carinate; inner segments oblong, obtuse, coriaceous, twice as long as the outer; female inflorescence resembling that in the male plant, but broader; spathes as in the male; spathellae ovate, acute, about 3 mm. long; spikelets approximate, shortly pedicellate, ovate, 2—3-flowered, 6—7 mm. long; barren bracts about 3, smaller than the fertile; fertile bracts broadly ovate, obtuse, bluntly mucronulate, coriaceous, 3—3.5 mm. long; perianth ovate, rounded on the dorsal

side and flattened on the ventral side, 4—5 mm. long; segments ovate, subacute, coriaceous, thinner at the margins; the outer-lateral keeled, sometimes shortly and sparsely villous on the keel; inner segments exceeding the outer by about 1 mm.; ovary oblong, obtusely 3-lobed, 3-celled; styles separated at the base.

Cape Province: South-Western Region; Malmesbury Div., without precise locality, Marloth, 10158, ♂ and ♀!

Closely allied to *D. aggregata*, Mast., but may be distinguished by its paniculate-cymose inflorescence, shorter spathes and larger spikelets.

D. chartacea, Pillans, *D. paniculatae* affinis, sed caulibus robustioribus, spiculis pluri-floris, segmentis exterioribus perianthii aristatis, seminibus minoribus differt.

Stems caespitose, erect, simple, terete, rigid, smooth, about 4 dm. high, 2.5—2.75 mm. in diam. at the middle; leaf-sheaths loosely convolute, broadly oblong, obtuse, mucronate, coriaceous, thinner at the margins, prominently nervose-striate, dull green, with golden iridescence, pale brown at the caducous apex, 2—2.5 cm. long; male inflorescence not seen; female inflorescence spiciform, densely many-flowered, linear-oblong, about 6 cm. long; spathes persistent, loosely convolute or erect-spreading and flattened, linear-oblong at the base to oblong-lanceolate at the apex, acute, chartaceous, nervose, soon lacerate, buff or light brown, mostly 2—2.5 cm. long; spikelets usually 2 in the axil of each spathe, subsessile, conical, compressed, 4—6-flowered, 12—15 mm. long; bracts closely convolute in their lower part, erect-spreading upwards, oblong-lanceolate, long-attenuate, filiform-aristate, long-fimbriate and white-membranous at the margins, otherwise cartilaginous and chestnut-brown, 12—15 mm. long (including the awn); perianth distinctly stipitate, oblong-lanceolate, triquetrous, straight or slightly curved in the upper part, dark chestnut-brown, 9—10 mm. long; perianth-segments oblong-lanceolate, acuminate, cartilaginous; the outer slender-aristate, membranous at the margins, nearly twice as long as the inner; the lateral slightly carinate; ovary oblong, 3-lobed, 3-celled, chestnut-brown; styles 3, apart at the base; capsule deeply 3-lobed, 3-seed; seeds elliptic, smooth, with a depressed-conical funicle, 1.75 mm. long.

Cape Province: South-Western Region; Stellenbosch Div., summit of Sneuwkop, Marloth, 3635, ♀!

Allied to *D. paniculata*, Mast., but distinguished by its stouter stems, several-flowered spikelets, aristate outer perianth-segments and smaller seeds.

Elegia lacerata, Pillans, *E. asperiflorae* proxime accedit, sed bracteis segmentisque perianthii laceratis facile distinguitur.

Stems caespitose or scattered on creeping rhizomes, erect, simple, slender, terete or occasionally slightly compressed, finely wrinkled, punctulate, 4—7 dm. high, 1.5—2 mm. in diam. at the middle; leaf-sheaths 3—5, remaining during the flowering period, ultimately deciduous, loosely convolute or expanded, linear-oblong, acute, subulate-mucronate, coriaceous, nervose at the apex, red-brown, membranous and paler at the margins, mostly 3—4 cm. long, up to 5 cm. long; male inflorescence paniculate-cymose, ovate to oblong, densely many-flowered, 1.5—3 cm. long; spathes persistent, expanded, oblong-lanceolate, slender-mucronate, chartaceous, red-brown, membranous and horn-colour at the margins, the lower mostly 2—3 cm. long; spathellae inconspicuous, lanceolate, aristate, membranous, mostly 4—5 mm. long with the awn; spikelets ovate or broadly wedge-shaped, compactly 3—10-flowered, 3—5 mm. long; bracts broadly ovate, acute, with a scabrid awn, cartilaginous, membranous and lacerate at the margins, dorsally scabrid, 3.5—4 mm. long (including the awn); perianth oblong, compressed, 1.75—2 mm. long; outer segments ovate-lanceolate, mucronate, membranous, finely lacerate at the margins, dorsally scabridous, red-brown; inner segments oblong, acute, lacerate along the upper margins, membranous, scarcely twice as long as the outer; female inflorescence resembling the male; spathellae as in the male; spikelets ovate to oblong, about 4-flowered, 4—5 mm. long; bracts ovate, acute, aristate, cartilaginous, membranous and lacerate at the margins, dorsally scabrid, 3—5 mm. long (including the awn); perianth compressed-trigonous, oblong, 1.75—2 mm. long; outer segments oblong, acute, slightly keeled, with a scabrid mucro, cartilaginous, membranous and lacerate at the margins, dorsally scabrid; inner segments, spatulate-oblong, acute, membranous, lacerate at the upper margins, about equal with the outer; ovary ovate, sharply 3-angled, smooth; styles 3, arising from a stylopodium.

Cape Province: South-Western Region; Worcester Div., Du Toit's Kloof, Bolus, 16997, ♂! Prince Albert Div., Zwartberg Pass, Bolus, 11661, ♂! Albany Div., stony hills near Graham's Town, MacOwan, 1360, ♂! 1359, ♀! King William's Town Div., summit of Perie Mt., Galpin, 5944, ♂! Stutterheim Div., Dohne Hill, Sim, 2843, ♂!

Most nearly allied to *E. asperiflora*, Kunth, but easily distinguished by its lacerate bracts and perianth-segments.

E. pectinata, Pillans, ab omnibus ceteris distinguitur caulibus densis, regulariter dispositis, modo duntaxat pectinae, rhizomatibus reptantibus.

Stems closely arranged like the teeth of a comb along a creeping rhizome, erect, often slightly curved, slender, simple, terete, solid, wrinkled and pitted, 10—20 cm. high, .75—1 mm. in diam. at the middle;

leaf-sheaths subsistent on the lower parts of the stems, deciduous on the upper, loosely convolute, oblong, acute to obtuse, mucronate, coriaceous, chestnut-brown, chartaceous and paler at the apex and margins, striate on the upper half, 1—1.5 cm. long; male inflorescence paniculate-cymose, oblong, densely many-flowered, mostly 1—2 cm. long; spathes soon falling, lanceolate-oblong, acute, mucronulate, cartilaginous, chestnut-brown, the lower 1—1.5 cm. long; spathellae minute, membranous; spikelets oblong with 2 flowers or transversely trigonous with 3 flowers, 3—3.5 mm. long; bracts ovate, obtuse, hyaline-membranous, 1.5 mm. long; perianth oblong, subterete, 2.75—3 mm. long; outer segments oblong-ovate, acute, membranous, with prominent midrib; inner segments oblong, subacute, cartilaginous, twice as long as the outer; female inflorescence spicate-cymose, linear-oblong, few-flowered, 1—2 cm. long; spathes persisting during the flowering period, sheath-like, but smaller; spathellae minute or absent; spikelets obliquely oblong, 1—2-flowered, 2.5—3.5 mm. long; bracts deltoid, acute, membranous, with rigid midrib, 1.5—2 mm. long; perianth oblong, trigonous, 2—2.5 mm. long; outer segments oblong, acute, cartilaginous; the lateral navicular, keeled; the anterior with prominent midrib; inner segments ovate-oblong, subacute, cartilaginous, equal with the outer; ovary pear-shaped; styles 3.

Cape Province: South-Western Region; Cape Div., on dry clay slopes, Lion's Head, Pappe in Herb. Mus. Austr.-Afr., 12850, ♂ and ♀! 12975, ♀! On clay slopes, north aspect on Devil's Peak, Pillans, 3401, ♂ and ♀! Above Oude Kraal, Pillans, 3403, ♂ and ♀! Caledon Div., on clay slopes, Sir Lowry's Pass, L. Guthrie in Herb. Bolus, 16622, ♀! Zwartberg, near Caledon, L. Guthrie in Herb. Bolus, 16016, ♂!

Distinguished from all other species by its closely and evenly arranged stems, like the teeth of a comb, along creeping rhizomes.

Restio tuberculata, Pillans, comb. nov. = *Leptocarpus divaricatus*, Mast., Engl. Bot. Jahrb. xxix, Beibl. 66, p. 9 (1900).

Dovea nuda, Pillans, comb. nov. = *Elegia nuda*, Kunth, Enum. iii, p. 462 (1841).

Elegia thyrsioidea, Pillans, comb. nov. = *Dovea thyrsioidea*, Mast., Journ. Linn. Soc. x, p. 251 (1867).

Leptocarpus gracilis, Pillans, comb. nov. = *Hypolaena gracilis*, Nees MSS. in herb. Sonder; *Hypolaena? gracilis*, Mast., Journ. Linn. Soc. x, p. 266 (1867); DC. Monog. Phan. i, p. 375 (1878); *Hypolaena gracilis*, Mast., Fl. Cap. vii, p. 135 (1897).

THE POLLINATION OF *SATYRIUM BICALLOSUM*, THUNB.

By S. GARSIDE.

As comparatively few observations have yet been made upon the pollination of South African orchids, the following account should be of interest to those who are in a position to make further and much needed contributions to the subject. In the literature I have consulted, I have found no record of an insect having been seen to enter an orchid flower, and remove the pollinia from any South African orchid. Considering that many of the very numerous species of orchids which occur in the south-western region of South Africa are very common, this lack of information is somewhat remarkable. The possibility that many of the highly scented greenish orchids might be pollinated by night-flying insects might account for our scant knowledge of these. However, observation of such a brightly coloured orchid as the scarlet *Satyrium coriifolium*, Sw., a species with both attractive colour and abundant nectar, shows that the visits of diurnal insects are by no means frequent. An examination of the anther of this species usually gives evidence of insect visits, as the pollinia are frequently removed from the lower and older flowers in a spike. As this paper will indicate, cross-pollination may, in certain cases, occur only during a very few hours in the day, so that a patient watch would have to be kept before the pollinating insect would be discovered.

For a few South African orchids, we already have several scattered observations, in the nature of records of the capture or observation of insects carrying distinctive pollinia of known origin. The observations of several botanists have also proved that for several species, the pollinia are quite regularly removed, but the full story of the method of cross-pollination has not, so far, been available for a single South African orchid.

As the literature relating to pollination is very scanty, the results so far obtained can be briefly reviewed here.

Trimen¹ says that in *Disa grandiflora* (*D. uniflora*) insect visits are rare. The brilliant colour indicates that day-flying lepidopterous or hymenopterous insects are the visitors. He also notes that the pollinia are very infrequently removed. Marloth² records the capture of a butterfly, *Meneris tulbaghia*, with a pollinium of *Disa grandiflora* attached to its body. A figure of the insect, with the pollinium attached to the proboscis is given³.

¹ Trimen, 1864.

² Marloth, 1895.

³ *Id.* 1915, Plate 59, Fig. 12.

He also records¹ that *Disa graminifolia* bears seed regularly, and concludes that it must be visited by insects, although after many years' observation, he has only noticed the visits of two insects; one a fly, *Pagonia angulata*, and the other a small butterfly, *Lycaena asteris*. In the case of *Disa ferruginea*, Marloth² states that the flowers are regularly visited by the butterfly *Meneris*. Finally, for *Satyrium coriifolium*, Marloth³ figures a bee, *Lasioprosopa bigoti*, Macq., as the visitor, although no mention is made of this insect in the text. Weale⁴, who observed Lepidoptera with pollinia attached, says: "In the spring of 1865, near the Koonap river, I caught several specimens of the smaller variety of *Pieris gidica*, and likewise of *Pieris charina*, with pollinia of some unknown species of orchid loosely attached to the sternum. On searching the neighbourhood, a new species of *Bonatea* (*B. Darwinii*) was discovered." The stigmatic surfaces were seen to be thickly covered with pollen, and the flowers, which secrete honey abundantly, were observed to be frequently visited by insects.

In the other papers dealing with pollination, the actual pollinating insect was not observed. Trimen⁵ described the structure of the flower of *Bonatea speciosa*, from plants procured at Knysna, but grown in a conservatory in Cape-town. He says: "I am unable to supply any details as to the extent to which insect fertilisation is effected in this orchid, having had no opportunity of observing the plant in its natural localities."

Weale⁶ describes the structure of a species of *Disperis*, in which he suggests that the tarsi of insects cause the removal and transport of the pollinia, as in the case of Asclepiadaceae. The orchid concerned produces numerous fertile capsules, but insect visits are not recorded. There is a note to this paper to the effect that this and two other papers sent to the Linnean Society were accompanied by drawings. These drawings were not published, and the Secretary of the Linnean Society informs me that the drawings are not now available. Weale does not state the specific name of the *Disperis* he examined, and without the drawings, the account is of little value. In another paper⁷, he mentions that in *Disa macrantha*, the flowers are of a bright colour, with strong scent, and of conspicuous size, though he did not observe insect visits or insects with pollinia attached. He suggests that insect visits occur, as the plant bears an abundance of seed, but he also observed that self-pollination was very frequent. He says: "A jerk will detach pollinia and bring them into contact with the stigma. This in nature is not unseldom the case, as I have repeatedly found many flowers thus fertilised."

In a following paper, Weale⁸ gives some notes upon some South African species of *Habenaria*. He says: "The plant does not appear to be visited by diurnal insects, but must be very attractive to nocturnal ones, as, although

¹ Marloth, 1915, p. 59.

⁴ Weale, 1869.

⁷ *Id.* pp. 45-47.

² *Id.* p. 189.

⁵ Trimen, 1867.

⁸ *Id.* pp. 47-48.

³ *Id.* Plate 56, C 7.

⁶ Weale, 1873, pp. 42-45.

each spike bears many flowers, and the plant itself grows in considerable abundance on the open grassy flats, almost every flower that I have examined has been fertilised."

Bolus¹ has made observations upon the frequency of the removal of the pollinia in *Disperis capensis* and *D. villosa*, possibly by night-moths. He observed no insect visits.

My attention was first directed to *Satyrium bicallosum*, Th. by a remark made by Dr Bolus². He says: "In the structure of the column this species differs from any other known to me. The anther, instead of hanging vertically under the rostellum with its glands pointing forward, as is the typical structure in the genus, appears as if pushed up against the apex of the column, so as to lie nearly horizontal, with the glands turned to the back of the flower, and the stigma completely covered and hidden from view. The economy of its pollination is a puzzle to me, for the appearance is as if the process were carefully prevented....But I have not had the opportunity of watching it, and have never seen any insect or trace of insect-work on the plant." These remarks led me to suppose that possibly this was a case in which self-pollination occurs, particularly as the flowers are rather small and inconspicuous, although belonging to a genus with typically large and brightly coloured flowers. Through the kindness of Miss Watermeyer, of Jonkers Hoek, Stellenbosch, I was able to secure a large number of inflorescences for examination, and also to make observations upon the plants growing under natural conditions. The first group of inflorescences examined showed evidence of insect visits. Quite regularly, the lower flowers on a spike were found to have both pollinia removed, whereas open flowers in the upper part of the spike had only one pollinium extracted. This observation at once indicated that cross-pollination might occur, and that a search would have to be made for the stigmatic surface, which Dr Bolus supposed to be completely hidden from view. As the account and figures of the column of this flower were made by Dr Bolus for purposes of systematic work, the results of a more detailed examination of the structure must now be given. As the structure of the column is intimately correlated with that of the perianth and bract, the latter will be first described. The inflorescence is a spike, from 3 to 10 cms. long, with the flowers arranged in a crowded spiral, and each flower in the axil of a large, curved bract. The acuminate apex of the bract reaches to the galeate posterior petal, and, as the blunt tip of the petal (labellum) is somewhat depressed, each flower has two lateral entrances (Plate VI, Fig. 12). This great depression of the galea, forming two eye-like openings, together with short bracts in the upper part of the spike, constitutes the variety *ocellatum* Bolus³. It is obvious, owing to this peculiarity of structure, that only one pollinium (the right hand or the left hand one) can be removed at once, thus accounting for the numerous cases

¹ Bolus, 1918, p. 42.

² *Id.* p. xxii.

³ *Id.* p. 41.

in which I observed recently opened flowers with only one pollinium removed. In most species of *Satyrium*, the three sepals and the two lateral petals form a median resting place for insects, and there is only a single entrance to the flower. In this type, the simultaneous removal of the pollinia is possible. In *S. bicallosum*, each entrance to the flower has an alighting place formed of a lateral petal and a lateral sepal (Fig. 7), and each aperture leads almost directly into one of the two short saccate spurs of the galea. In the specimens studied by me, the flowers were of a dull greenish-yellow colour, but on the galea, and just above the spurs, there were lurid purple spots, one above each spur; this coloration often extended to the spurs themselves. When viewed from the front, the two purple "eyes" in the depths of the flower have a striking appearance, and no doubt form one of the features attractive to insects. The dull yellow and purple coloration, uncommon in *Satyrium*, but found in a few species such as *S. pumilum*, Thunb. and *S. Lindleyanum*, Bolus, indicate a fly pollinated flower; such coloration being frequent in *Stapelia* and other fly flowers. I was unable to detect any scent however.

The column itself is of an unusual type. Instead of being slender and arcuate, as in most *Satyria*, it is very short and condensed, and almost hidden from view behind the depressed apex of the galea (Fig. 7).

The stigmatic lobe of the column is formed of two curved, finger-like processes, directed towards the front of the flower; immediately underneath the processes, the stigmatic surface is situated (Figs. 1 and 2). The finger-like processes are depressed to such an extent that the stigmatic surface is almost divided into two lateral portions, each one abutting upon the adjacent passage leading to the spur (Fig. 6). These surfaces are viscid when receptive, and that they are definitely stigmatic is proved by the ease with which I was able to germinate the pollen masses upon them. I also observed the very numerous pollen tubes penetrating the tissues. Many flowers were examined in which pollen had been placed on the stigma by insect agency, and in these cases the pollen grains had also germinated.

The anther is of the usual type in *Satyrium*, but, as Dr Bolus notes, the entire anther is tilted upwards in such a fashion that the two viscid discs are directed towards the back of the flower.

The adhesive disc of each pollinium, however, projects somewhat laterally into the adjacent passage to the spur (Fig. 6). When mature the pollinia lie rather loosely in the anther cells, and are easily removed. Each pollinium consists of from 40 to 50 massulae, loosely held together, the entire mass being pear-shaped, and cleft almost into two portions (Fig. 4). The caudicle is rather short, and the adhesive disc circular. Just below each anther lobe is a white callosity, composed of a mass of cells which disintegrate, soon after the flower opens, to form a fluid mass. These callosities are considered to be rudimentary stamens. They probably do not function at any time as food

bodies for insects, as I found the cells of which they are composed to be full of fine raphides of calcium oxalate (Figs. 1, 2 and 3).

From the above description, it will be realised that each half of the flower has its own entrance, with its alighting place for insects; its own pollinium, with adhesive disc projecting laterally into the passage, and its own stigmatic surface, placed just above the adhesive disc. Each half of the flower also has its own spur. The possibility of the separate functioning of the halves of a zygomorphic flower is of great interest. In the case of actinomorphic flowers, we have *Iris*, with three "entrances," but instances of zygomorphic flowers with separately functioning halves are very rare. It will be of value, for purposes of comparison, to determine the pollination mechanism in *S. Lindleyanum*, Bolus, in which species the flower is not so completely divided into distinct halves, and in which the viscid discs are directed towards the front of the flower.

After the above structural details had been observed, it became necessary to seek for the pollinating insects. As there was a possibility of insect visits at night, and the plants were growing upon a steep mountain side, several miles from a house, it seemed likely that a prolonged watch would have to be kept.

I was fortunate enough to discover the insect in a fashion which conveys a useful suggestion to those interested in orchid pollination, and which is therefore worth recording here. The plants were growing in a moist place where there was a trickle of water through the soil, from the mountains behind. I noticed numerous plants of *Drosera hilaris*, Ch. and Schl. in the same locality, and it occurred to me that if I could find a *Satyrium* plant in the centre of a group of *Drosera*, I might find the pollinating insect already captured. I soon discovered the required combination; a fine *Satyrium*, almost entirely surrounded by *Drosera*. On examining the leaves of the latter, no less than a dozen small black flies were seen to have become stuck to the tentacles, each fly with one, two, or even three pollinia attached to it.

I am indebted to Mr T. R. Edwards, of the British Museum, for the identification of this insect. He informs me that it is a species of *Sciara*, of the Family Sciaridae. The larvae live in rotting wood and decaying vegetable matter.

After a further search in the vicinity of the *Satyrium* flowers, I discovered two other specimens of the fly, one bearing two pollinia on the left side of the thorax at the base of the wing, and one bearing three pollinia in the corresponding position.

The insects were running rapidly over the ground, and did not take flight even when disturbed. No doubt they were overburdened by the pollinia, which are large in comparison with the insects bearing them. These observations were made at 12.30 p.m., October 2nd, 1920, the weather at that time

being warm, but dull and cloudy. Later, on the same day, at 2.30 p.m., I saw another fly running up the spike of a *Satyrium*, amongst the bracts and the bases of the ovaries. Presently, it ascended a flower, and entered the left hand opening. The fly was evidently exploring the spur, and, as it stood in the opening, it placed itself at an angle of about 45° to the horizontal. This tilted position is exactly that required to bring the base of the wing into contact with the viscid disc. After a few seconds, the fly withdrew, bearing a pollinium attached to the thorax. I have removed numerous pollinia artificially, but have never observed any subsequent curvature or movement of the caudicle.

Indeed, owing to the position of the stigmatic surface immediately above the horizontally placed anther lobe, scarcely any subsequent movement of the caudicle is needed. When a fly bearing a pollinium, say on its right shoulder, enters the right half of a flower, the pollen mass will almost inevitably come into contact with the stigmatic surface. It seems probable that the curved lobes which over-arch, and are in intimate contact with the stigmatic surfaces, will help in this matter, as, when a fly bearing a pollinium on the correct side withdraws from the passage, the hooked process will retard the pollen mass, and cause it to strike the stigmatic surface. Self-pollination is avoided, as the pollinium is not withdrawn from the pollen sac until the fly is leaving the flower.

As regards the food substance which attracts the fly, I have made the following observations. No honey is secreted at any time within the spur, and an examination of the internal surface always showed this to be quite dry. The base and sides of the spur are studded with numerous papillate, or shortly clavate hairs (Fig. 6), and these unicellular hairs contain abundant protoplasm and cell-sap (Figs. 8 and 9). In some cases, the hairs are elevated upon small humps of tissue (Fig. 8). Small drops of a highly refractive, oily substance are to be observed on the outside of each hair. The flies of the genus *Sciara* have a comparatively short proboscis, consisting of two muscular pads, adapted for sucking up liquids; they have no hard mouth parts with which to bite or perforate. It does not seem probable that the insects bite or puncture the clavate hairs in order to suck out the cell sap; they are more probably attracted by, and lick up, the oily extra-cellular secretion on the surfaces of the hairs. This is a matter somewhat difficult to investigate, as it is impossible to observe the fly when actually at work inside the flower. I did not determine the exact origin of the oily secretion, and the question of the attractive food substance, and the mode of obtaining it is still somewhat problematical.

For purposes of comparison, I studied the structure of the spur of *Satyrium coriifolium*, Sw., a species in which, as is well known, honey is secreted abundantly. I found the interior surface of the spur in newly opened flowers, to be quite dry, but covered with elongated, juicy hairs (Fig. 5). The hairs are longer towards the opening of the spur. In a slightly older flower, the epidermis

at the apex of the spur was shedding its cuticle, and below this, the epidermal cells were secreting a sugary liquid. In a still older flower, the spurs were more than half filled with honey, and the few hairs remaining had their cell contents disintegrated. The cuticle had become entirely detached from the epidermis. Secretion of honey, in this species is sub-cuticular, and occurs after the flowers have opened. Honey is most abundant in the lower flowers of a spike, i.e., in those flowers in which the stigmatic surfaces are receptive. It thus appears that the spurs of *Satyrium bicallosum* remain throughout the life of the flower in a condition comparable to that found only in newly opened flowers of *S. coriifolium*. It will be remembered that Darwin¹ found no free honey in the spurs of *Orchis morio*, *O. maculata* and *O. pyramidalis*, and concluded that the visiting insects penetrate the membranes lining the spur, in order to obtain the sugary juice beneath.

During the daytime, the flies concerned in the pollination of *S. bicallosum* are not frequently seen, but at dusk they appear in large numbers, and fly fairly actively. It seems probable that cross-pollination takes place most frequently at nightfall, and that once a fly has a pollinium attached, it does not usually again take flight, but runs from flower to flower, and from inflorescence to inflorescence. Almost all flowers from the lower part of the spike have both pollinia removed after the flower has been open for a night, and, as the plants set seed abundantly, cross-pollination must be very effectively carried out.

I saw no other insect visitors, though aphides are occasionally seen at the bases of the ovaries; they play no part in pollination.

Members of the genus *Satyrium* are fairly abundant in the south-western district of South Africa, but, although some species are so common, practically nothing is known as to their mode of pollination. From their structure and colouration, *S. pumilum*, Thunb. and *S. saxicolum*, Bolus, would appear to be particularly interesting types; while the very remarkable structure of the column in *S. rhynchanthum*, Bolus would well repay further study. It is to be hoped that those in a position to carry out field observations will continue this work.

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¹ Darwin, 1904.

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REVIEW

LICHENS. BY ANNIE LORRAIN SMITH, F.L.S., Acting-Assistant, Botanical Department, British Museum. Pp. xxviii + 464, with 135 figures in the text. *Cambridge: at the University Press*, 1921. Price: 55s. net.

ALTHOUGH a few lichens from the Cape of Good Hope were described by pre-Linnean botanists, and three or four by Linnaeus himself, or by his son, the first important account of the Cape lichens is that given by Carl Thunberg in his *Prodromus* (Pars posterior, 1800).

The list of species is a short one and the descriptions are in the brief style of that day. A fuller account of the same thirty-nine species is, however, given in Thunberg's *Flora Capensis* of 1823 (Edition Schultes), where the localities from which Thunberg's specimens were obtained are mentioned.

A striking feature of this list is that it contains a number of endemic species which still remain amongst the most interesting members of the South African lichen flora; although since Thunberg's day our knowledge has been very considerably extended.

Of the botanists of a later date who have collected lichens in South Africa, perhaps no one was more enthusiastic than the late Professor MacOwan. Though not himself a lichenologist, he collected a large number of new species which he forwarded to Europe, where they were subsequently described, for the most part by continental botanists.

Unfortunately for the South African lichenologist, scarcely a trace of all this work is to be found in any South African museum; the type specimens are scattered through the European herbaria, and the duplicates are mostly in private hands.

Before any complete account of the South African lichen flora can be given, the records of over one hundred and twenty years' work must be correlated: a task presenting obvious difficulties for reasons already stated.

What is required before much further progress can be made is the establishment of collections of lichens in the larger herbaria, and only in this way will the material for a monographic account of South African lichens again become available.

It is in this connection that Miss Lorrain Smith's work will be of very considerable value to the South African collector and student of lichens, as, since the publication of Schneider's *Text Book of General Lichenology* in 1897, no other work has appeared giving an account of the group in the English language.

After a brief introduction, in which collecting methods, and the uses of chemical reagents in lichenology are described, a short history of the subject is given. The structure of the lichen thallus is then treated in a very comprehensive manner; over one hundred and twenty pages are devoted to this and to vegetative reproduction.

In about fifty more pages, an account is given of the methods of reproduction by spores, and the results of many researches as to sexuality and the origin of the fruit body in lichens, are summarised. There is a chapter on cell products and general physiology, and subsequently the subject of the origin and evolution of lichens receives adequate treatment.

The section dealing with classification will be particularly useful to the South African worker, as it enables the genera to be identified. No doubt many overseas botanists will wish that this part of the work could have been elaborated, and the entire lack of illustrations of the genera will be much regretted.

An error occurs on p. 324, where *Combea*, one of the endemic Cape Roccellaceae, is said to have "gonidia absent from the hypothecium." This is the character of *Pentagenella*, *Combea* having a well defined gonidial layer below the hypothecium. The same error occurs in Zahlbruckner's account of the Lichens in Engler and Prantl, *Nat. Pfl.* 1, 1* (key to the genera of Roccellaceae), from which it has crept into several works.

On p. 323, the apothecia of all Roccellaceae, except those of *Roccellina*, are said to be lateral. *Combea* is, of course, characterised by its large, terminal apothecia.

The genus *Dermatiscum* (p. 330), is said to have two species, one in Europe, the other in America. The sulphur coloured, endemic *Dermatiscum Thunbergii*, Nyl., of Olifant's Bad and the Montagu Pass is not mentioned, though of considerable interest to South African students, owing to the quaint history of its "discovery" by Leighton in the Burchell herbarium at Kew, four years after the death of the famous collector. Leighton described and figured it as a new species, but it was subsequently identified by Nylander as being the "Lichen Thunbergii" of Thunberg's *Flora Capensis*, and had been described by Acharius no less than eighty years before.

A very important feature of the present work is the section devoted to ecology, as it is in exactly this field that the South African worker can make much needed contributions to the science. The Cape Peninsula is almost unique in the variety of habitat which it affords in a very limited area, and a thorough study of the growth forms assumed by a single species under varied conditions of altitude, rainfall, and exposure to light would be of more than local interest.

The ecological section is the most complete of its kind, containing a full account of almost all previous work on the subject.

A bibliography, covering twenty-five closely printed pages, concludes the

work. As all these books and papers are alluded to in the text, and in many cases rather fully summarised, the detailed nature of the work will be realised. This latter feature will make it invaluable in a country with limited library facilities, and such a consideration should serve to counterbalance the somewhat high cost of the work.

The book is bound in the style of West's *Algae* in the same series, though the illustrations do not, in many cases, do justice to the plants they picture. Lichens are always difficult subjects for the photographer, and no doubt many of the photographs used to illustrate the text have suffered in reproduction.

It is to be hoped that the work will afford a much needed stimulus to lichenology in South Africa, and all botanists will owe a debt of gratitude to Miss Lorrain Smith for the exceedingly able manner in which she has presented and made readily accessible a vast fund of information.

S. G.

EXPLANATION OF PLATE

PLATE VI

- Figs. 1, 2 and 3. Three views of the column of *Satyrium bicallosum*, Thunb. All $\times 20$.
Fig. 4. A pollinium of *S. bicallosum*, Thunb. $\times 60$.
Fig. 5. A hair from the interior of the nectar spur of *S. coriifolium*, Sw. $\times 100$.
Fig. 6. Side view of a flower of *S. bicallosum*, Thunb., with a portion of the posterior petal removed. $\times 10$.
Fig. 7. Front view of a flower of *S. bicallosum*, Thunb. $\times 10$.
Figs. 8 and 9. Glandular hairs from the interior of the spur of *S. bicallosum*, Thunb. $\times 500$.
Fig. 10. The pollinating insect (a species of *Sciara*), with two pollinia attached to the thorax. $\times 8$.
Fig. 11. Back view of the flower of *S. bicallosum*, Thunb., showing the two saccate spurs. $\times 7$.
Fig. 12. Front view of the flower of *S. bicallosum*, Thunb., with the braet in position. $\times 7$.



Fig. 1



Fig. 2



Fig. 3



Fig. 4

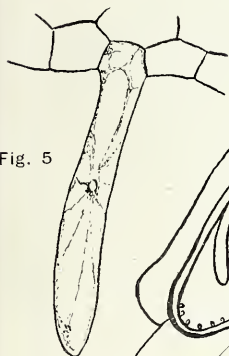


Fig. 5



Fig. 6

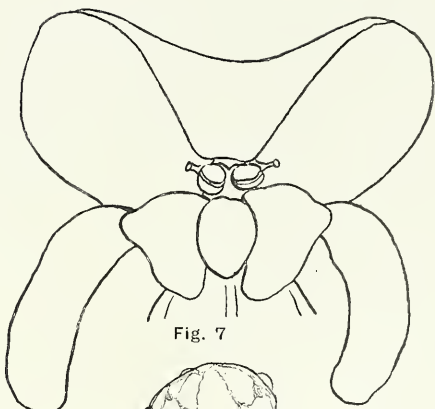


Fig. 7

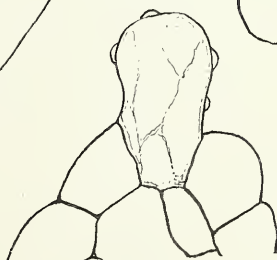


Fig. 8

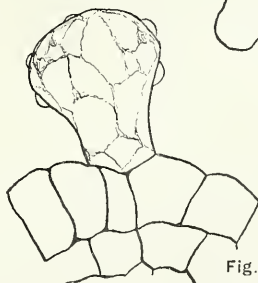


Fig. 9

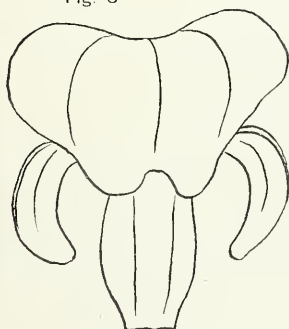


Fig. 11

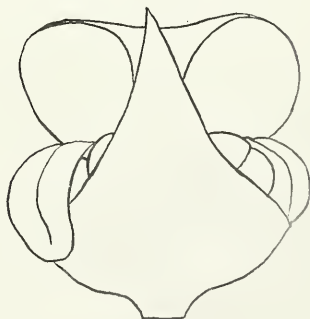


Fig. 12



Fig. 10

NOVITATES AFRICANAE

Mesembrianthemum cupreum, L. Bolus. Glabrum, ramis confertis, saepius dense 4-foliatis, folia connata, vagina ad 1.4 cm. longa, juniora (par secundum) 3-quetra, apice fere truncata leviterque serrulata, ad 3.5 cm. longa, 0.4 cm. lata, seniora (par primum) turgide 3-quetra, supra plana, obtusissima vel subtruncata, laevia, alterum adscendens, alterum recurvum, ad 2.8 cm. longa, 0.8 cm. lata; pedunculus teres, 5.5—7.5 cm. longus, basi 2-bracteatus, bracteis alte connatis, 2—2.5 cm. longis, gemmiferis, floribus lateralibus tardissime evolutis; flores meridie expansi, 3.8 cm. diam.; calyx depresso crateriformis, tubo apice constricto, 0.4 cm. longo, segmentis 4, inter se leviter inaequalibus, ovato-oblongis, 0.8—1 cm. longis, duobus membranaceo-marginatis; petala pluri-seriata lineari-spathulata acuta integra, supra medium rubro-cuprea, inferne pallida, basi aurea, pagina inferiore roseo-purpurea, 1.3—1.7 cm. longa; stamina erecta, in diam. 1 cm. metientia, filamentis aureis, intimis parce barbatis, 0.2—0.5 cm. longis, antheris subnigris, polline alido; discus annularis crenulatus; ovarium leviter convexum, stigmatibus 12, suberectis lanceolatis acuminatis, stamina extima attingentibus, 0.4 cm. longis.

Cape Province: Western Region; Vanrhynsdorp, *E. B. Watermeyer* (National Botanic Gardens, No. $\frac{1}{2} \frac{2}{3}$).

Described from a specimen which flowered at Kirstenbosch, June 1923.

Mesembrianthemum anemoniflorum, L. Bolus, *M. dubio* affine, sed foliis saepius brevioribus, basin versus angustatis, calyce fere turbinato, petalis salmoneis, et staminibus effusioribus, inter se inaequilongis, differt.

Glabrum, ramis sarmentosis, internodiis 1.5—2.5 cm. longis, ramulis floriferis erectis, 2—6-foliatis, saepius 2—4 cm. longis; folia basi connata, adscendentia vel alterum patens alterumque incurvum, medio subteretia, apicem versus triquetra, abrupte angustata, apiculata, basin versus gradatim angustata, glauco-viridia purpurascencia laevia, 2—2.5 cm. longa, ad 0.5 cm. lata; pedunculus teres, infra medium 2-bracteatus, 1.5—2 cm. longus; flores meridie expansi, ad 6 cm. diam.; calyx fere turbinatus, circa 1.4 cm. longus, segmentis 5, inter se subaequilongis, ovatis acutis, ad 0.9 cm. longis, tribus membranaceo-marginatis; petala 2—3-seriata lineari-spathulata, saepe subacuta, integra, basin versus pallide, apicem versus saturate, salmonea, extima

circ. 2.5 cm. longa, 0.3 cm. lata; stamina diffusa, in diam. circ. 1.7 cm. metientia, filamentis albis, ad 0.6 cm. longis, intimis obscure barbatis stigmata excedentibusque, antheris pallidis, polline aureo; discus inconspicuissimus; ovarium conico-convexum, stigmatibus 10—18, adscendentibus vel ovario adpressis, subulatis aureis, 0.2 cm. longis, stamina intima leviter excedentibus.

Cape Province: South-Western Region; Caledon Div., nr. Hermanus, *Mrs Strangman* (National Botanic Gardens, No. $\frac{2597}{16}$).

Allied to *M. dubio*, How., but differs in having usually shorter leaves gradually narrowed towards the base, an almost turbinate calyx, salmon-coloured petals, and more effuse stamens of which the innermost are much shorter than the outer ones.

Described from specimens which flowered for several years at Kirstenbosch during September.

Mesembrianthemum primulinum, L. Bolus (§ Corniculata). Glabrum, ramis sarmentosis, saepe 25 cm. longis vel ultra, internodiis 2—7 cm. longis, ramulis dense 4—6-foliatis, vel floriferis 2-foliatis; folia suberecta vel subincurva, connata, vagina 0.3—0.4 cm. longa, dorso rotundata, supra plana, subpallide, sed tamen laete, viridia, laevia, ad 6 cm. longa, basi 0.7 cm., medio 0.5 cm., lata; pedunculus ebracteatus, superne parum dilatatus, ad 9 cm., saepius 6—8 cm., longus; flores meridie expansi, ad 6.5 cm. diam.; calyx depressus, tubo 0.4—0.5 cm. longo, segmentis inter se valde inaequalibus, 0.6—2 cm. longis, vel ultra, duobus late membranaceo-marginatis; petala sublaxa 3-seriata spathulata integra, inferne pallida, superne primulina, ad 3 cm. longa, ad 0.4 cm. lata; stamina erecta, demum diffusa, in diam. circ. 1 cm. metientia, filamentis pallidis, inferne barbatis, 0.3—0.4 cm. longis, antheris albis; discus annularis crenulatus; ovarium conico-convexum, stigmatibus 10, adscendentibus vel patentibus, subulatis acuminatis, 0.3 cm. longis.

Cape Province: Vanrhynsdorp Div.; Bakhuis, Dec. 1910, *H. H. W. Pearson* and *N. S. Pillans* (Percy Sladen Memorial Expedition, No. 5480; Pillans, No. 2035, National Botanic Gardens, No. $\frac{426}{16}$).

Described from numerous living specimens. This species has grown freely in Mr Pillans' garden for the last twelve years, flowering in August and September.

Mesembrianthemum curtophyllum, L. Bolus (§ Corniculata). Glabrum, ramis decumbentibus, in pedunculum terminantibus, 8—13 cm. longis, internodiis 1—2.5 cm. longis, ramulis dense 4—6-foliatis; folia connata, vagina 0.3—0.4 cm. longa, erecta vel alterum incurvum alterumque recurvum, subteretia acuta, saepius apiculata, saepe e medio superne dilatata, laevia, laete viridia, ad 2.3 cm. longa, ad 0.6 cm. lata, caulina ad 3.5 cm. longa, in hoc sectione breviora; pedunculus teres, prope

basin 2-bracteatus, 4·5—5 cm. longus; flores meridie expansi, 3·7 cm. diam.; calyx depresso crateriformis, tubo 0·4 cm. longo, segmentis inter se subaequilongis, 0·5—0·7 cm. longis, duobus late membranaceo-marginatis; petala 2-seriata vel, extimis brevioribus additis, 3-seriata, linearia, obtusa vel acuta, ad basin parum angustata, roseo-purpurea, inferne dilute purpurea obscureque vittata, 0·5—1·4 cm. longa, ad 0·2 cm. lata; stamina erecta vel subdiffusa, in diam. 0·7 cm. metientia, filamentis albis, basi barbatis, inter se subaequilongis, ca. 0·4 cm. longis; discus annularis vel glandulis plus minusve discretis; ovarium conico-convexum, stigmatibus 10, subulatis acuminatis, 0·3 cm. longis.

Locality and collector unknown (National Botanic Gardens, No. ³⁸⁶/₁₆).

Described from a plant which flowered at Kirstenbosch in June 1921.

Mesembrianthemum platycalyx, L. Bolus (§ Corniculata). Glabrum, ramis sarmentosis, internodiis 3—5 cm. longis, ramulis patentibus, 4—6-foliatis; folia connata, vagina subtumidula, ad 0·6 cm. longa, matura dorso rotundata, supra plana, acuta vel obtusa, 5—7 cm. longa vel caulina ad 10 cm. longa, medio ad 0·6 cm. lata; pedunculus 7—9 cm. longus, prope basin vel supra medium 2-bracteatus, bracteis interdum floriferis, floribus lateralibus tardissime evolutis; flores meridie expansi, fere ad 6 cm. diam.; calyx praecipue depressus, tubo circ. 0·3 cm. longo, segmentis 5, inaequalibus, tribus foliis similibus, duobus membranaceo-marginatis, 0·8—1·5 cm. longis; petala linearia acuminata, supra medium latissima, inferne gradatim angustata, integra, inferne albis vel pallide roseis, superne saturate roseis, inter se subaequilonga, ad 2·8 cm. longa, ad 0·25 cm. lata; stamina erecta vel subdiffusa, in diam. metientia 1·3 cm., filamentis albidis, 0·3—0·5 cm. longis, interioribus barbatis, antheris brunneo-purpureis, polline pallido; discus annularis inconspicuus; ovarium convexum, stigmatibus 12—13, erectis, apice recurvis, demum patentibus, acuminatis ramentaceis, 0·3 cm. longis.

Cape Province: Karroo Region; near Matjesfontein, *N. S. Pillans* (Bolus Herbarium, No. 15946).

Described from living specimens which flowered in Mr Pillans' garden, Rosebank, near Cape Town, in June and August.

Mesembrianthemum Schollii, Salm Dyck—var. *caledonicum*, L. Bolus. Rami breves densi, plantam compactam formantes, rarissime elongati procumbentes; folia adscendentia connata, vagina ad 1 cm. longa, triquetra acuta apiculata, supra plana, lateribus leviter convexis, angulis, carina praecipue, cartilagineo-serrulatis, saturate viridia, 3·5—8 cm. longa, ad 1 cm. lata; flores 5-meri, meridie expansi, 2·5—3·2 cm. diam., ternati vel bi-ternati, vel in cymam, regulariter ramosam, subcongestam, 8 cm. longam, 6 cm. diam., dispositi, pedunculis 1·5—3 cm. longis, lateralibus bracteatis, bracteis supra sat profunde concavis, carina cartilagineo-

serrulata, marginibus integris, late membranaceis; alabastrum acuminatum; calyx subturbinatus, tubo circa 0.4 cm. longo, segmentis ovatis acuminatis, vel interioribus lanceolatis, omnibus membranaceo-marginatis, 0.4—0.7 cm. longis; petala inter se subaequilonga, linearia obtusa integra, inferne leviter angustata, roseo-purpurea, saturatius vittata, ad 1.1—1.5 cm. longa, fere 0.2 cm. lata; stamina collecta, staminodiis purpureis filiformibus circumdata, in diam. 0.4—0.5 cm. metientia, filamentis incurvis, basin versus albis, superne purpureis, omnibus barbatis, 0.2—0.5 cm. longis, antheris pollineque luteis; discus annularis, crebre profundeque fissus; ovarium supra convexum, stigmatibus crassis subulatis setaceo-acuminatis, 0.35 cm. longis.

Cape Province; South-Western Region; Caledon Div., hillsides, near Caledon, fl. Sept., *M. M. Page* (National Botanic Gardens, No. $\frac{2273}{16}$). Sir Lowry's Pass, fl. July, *R. Glover* (*id.* No. $\frac{1901}{17}$).

Described from living plants which have flowered at Kirstenbosch for seven years from July to October.

Mesembrianthemum Duthieae, L. Bolus (§ Sarmentosa). Glabrum, ramis reptantibus, internodiis 2—3.5 cm. longis, ramulis floriferis erectis, 7—10 cm. longis, saepius inferne dense 6-foliatis, axillis gemmiferis, superne pedunculoideis, foliis supremis bracteiformibus; folia suberecta connata, vagina ad 0.6 cm. longa, 3-quetra vel angulo carinale medio rotundato, angulis integerrimis, supra concava, acuta viridia laevia, 2—8 cm. longa, ad 0.7 cm. lata, ad 0.8 cm. diam.; flores 5-meri, rite 3-nati, interdum solitarii, lateralibus deinum tardissime evolutis, meridie expansi, 2.4 cm. diam., pedunculis omnibus medio 2-bracteatis, 2—3 cm. longis; calyx turbinatus, tubo circa 0.4 cm. longo, segmentis ovatis acutis, 0.6—0.7 cm. longis, interioribus membranaceo-marginatis; petala inter se aequilonga oblanceolata obtusa, inferne pallidiora, superne roseo-purpurea, saturatius vittata, 0.8 cm. longa, 0.2 cm. lata; stamina collecta, staminodiis setaceo-filiformibus circumdata, in diam. apice 0.3 cm. metientia, filamentis incurvis, omnibus barbatis, albidis, superne purpureis, 0.3—0.5 cm. longis, antheris albis; discus annularis crenulatus; ovarium supra convexum 5-lobum, stigmatibus crassis subulatis setaceo-acuminatis, fere 0.3 cm. longis.

Cape Province: South-Western Region; Knysna, *A. V. Duthie* (National Botanic Gardens, No. $\frac{171}{15}$).

Described from living specimens which have flowered at Kirstenbosch for several years during August and September.

Mesembrianthemum Comptonii, L. Bolus. Tenuissime papillosum glaberrimum caulescens, 15—23 cm. altum, diffuse ramosum, ramulis subcompressis, 2.5—3.5 cm. longis; folia basi vix connata, adscendentia, interdum subfalcata, demum late patentia, turgidissime triquetra, dorso

basin versus rotundata, superne carinata, supra medium parum dilatata, apice subtruncata vel obtusa, purpureo-apiculata viridia, ad 4 cm. longa, 0.6 cm. lata, 1 cm. diametroque; flores 5-meri tri-ternati, meridie expansi, 2.7 cm. diam., pedunculis ad 3 cm. longis, omnibus, praeter ultimum, medio 2-bracteatis; calyx turbinatus, tubo 0.3 cm. longo, segmentis acutis, inter se inaequalibus, 0.5—1 cm. longis; petala inter se subaequilonga linearia, basin versus leviter angustata, alba, inferne inconspicue roseo-vittata, 1.1 cm. longa, 0.15 fere ad 0.25 cm. lata; stamina conico-collecta, staminodiis pallidis, superne rubro-purpureis, circumdata, filamentis pallidis, superne rubicundis, supra medium barbatis, ad 0.35 cm. longis; discus e 5 glandulis discretis semi-lunatis crenulatus compositus; ovarium supra convexum, stigmatibus subulatis setaceo-acuminatis, 0.2 cm. longis.

Cape Province: South-Western Region; Klaver, fl. July 1923, *R. H. Compton* (National Botanic Gardens, No. $\frac{295}{2}$).

Allied to *M. lunatum*, Willd., but very distinctly, though finely, papillose and with an apple-green tint, very different from the glaucous-green of its ally. The leaves are far more turgid and less falcate and the whole plant less woody.

Mesembrianthemum Edwardsiae, L. Bolus. Epapulosum glabrum caulescens, ad 25 cm. altum, crebre ramosum, ramis ramulisque dense foliatis; folia 3-quetra, lateraliter forte compressa, saepissime falcata, rarius patentia, oblonga vel rarius supra medium ampliata, apiculata, apiculo interdum recurvo, glauca laevissima, ad 2.5 cm. longa, medio ad 0.2 cm. lata, 0.7 cm. diam., ea in ramulis floriferis saepius 1.5 cm. longa, 0.15 cm. lata, 0.5 cm. diam.; flores 5-meri, rite bi-ternati, ad 1.2 cm. diam., meridie expansi, pedunculis, praeter ultimum, medio 2-bracteatis, in calycem haud gradatim transeuntibus; calycis tubus subcrateriformis, basi subtruncatus, medio leviter constrictus, 0.2 cm. longus, segmentis ovatis acutis, inter se aequilongis, 0.3 cm. longis, tribus membranaceo-marginatis; petala inter se subaequilonga, spathulata, acuta vel rarius obtusa, rosea, marginibus saturatioribus, 0.4 cm. longa, 0.1 cm. lata; stamina conico-collecta, staminodiis longe barbatis, inter se intertextis, circumdata, filamentis pallidis, medio vel apice barbatis, ad 0.2 cm. longis, antheris luteis; discus conspicuus annularis, irregulariter partitus; ovarium supra planum, sive in medio vero elevatum, stigmatibus lineari-filiformibus, 0.2 cm. longis.

Cape Province: South-Western Region; Clanwilliam Div., Oliphant's River Valley, anno 1914, *G. Edwards* (National Botanic Gardens, No. $\frac{2600}{14}$).

Allied to *M. lunatum*, Willd., but readily distinguished by the strongly compressed leaves and smaller flowers.

Described from living specimens which have flowered during July and August at Kirstenbosch for the last nine years.

Mesembrianthemum amplexicaule, L. Bolus. Epapulosum caulescens glabrum, ramis decumbentibus rigidis, fere ad 0.4 cm. diam., internodiis 1—2 cm. longis, ramulis floriferis fere erectis, cum floribus 4—7 cm. longis; folia amplexicaulia, haud connata, subfalcata, turgide 3-quetra, obtusa apiculata, supra leviter convexa, basi amplexicliente dilatata, glauco-viridia laevia, 1.2—3 cm. longa, 0.65 cm. lata, 0.5 cm. diam., pedunculis teretibus, 0.7—1.4 cm. longis, omnibus medio vel inferum bracteatis; calycis tubus brevis, segmentis 5, inter se subaequilongis, ovato-oblongis subacutis, 0.6—0.7 cm. longis, omnibus membranaceo-marginatis; petala 1-seriata linearia, basin versus parum angustata, acuta vel obtusa, purpureo-rosea, inferne pallidiora obscureque purpureo-vittata, ad 1.2 cm. longa, vix ad 0.2 cm. lata; stamina subdiffusa, 0.7 cm. diam. metientia, filamentis purpurascens, basi barbatis, 0.3—0.5 cm. longis, antheris pallidis pollineque luteo; discus annularis crenatus; ovarium supra conico-convexum, stigmatibus 10, lanceolatis, longe setaceo-acuminatis, apice recurvatis, luteo-viridibus, 0.5 cm. longis; capsula subglobosa, 0.7 cm. diam.

Cape Province: exact locality unknown.

Flowered in Mr N. S. Pillans' garden at Rosebank, near Cape Town, June 1921 (Bolus Herbarium, No. 17045).

Mesembrianthemum flaccidum, L. Bolus (§ Aurea). Glabrum, ad 20 cm. altum, ramis, cum foliis, flaccidis, internodiis ad 4 cm. longis; folia adscendentia vel patentia, vix connata, oblique 3-quetra, acuta, laete viridia, 2—4 cm. longa, 0.4—0.5 cm. lata diametroque; flores 5-meri solitarii, meridie expansi, 3.5 cm. diam., pedunculis teretibus, 5—6 cm. longis, medio 2-bracteatis; calyx turbinatus, segmentis acutis, inter se inaequilongis, 0.5—1 cm. longis, tribus membranaceo-marginatis; petala ca. 4-seriata lineari-spathulata integra aurea, interiora saturatius mediana linea ornata, 0.6—1.6 cm. longa, ad 0.25 cm. lata; stamina conferta vel subdiffusa, apice 0.5 cm. diam. metientia, filamentis aureis ebarbatis, 0.3—0.8 cm. longis, antheris luteis; discus obscurus; ovarium supra planum, stigmatibus subulatis acuminatis, superne purpurascens, 0.25 cm. longis.

Cape Province: South-Western Region; Montagu Div., open veld between Montagu and Montagu Baths, scrambling among bushes of *M. micans*, *M. M. Page* (Bolus Herbarium, No. 17258).

Described from a specimen which flowered in Miss Arbuthnot's garden, Wynberg, September 1922.

Mesembrianthemum miserum, L. Bolus. Epapulosum caulescens glabrum, ca. 37 cm. altum, laxo ramosum, ramis adscendentibus gracilibus teretibus, internodiis 1.5—3 cm. longis; folia adscendentia, interdum subfalcata,

connata, vagina ad 0.2 cm. longa, subturgide 3-quetra, supra plana, abrupte acuta, apiculata, inferne parum angustata, laevia, ad 1.7 cm. longa, 0.25 cm. lata; flores 5-meri, in cymam inaequaliter ramosam, ad 6 cm. longam, dispositi, vel 1—3-nati, 0.7 cm. diam., pedunculis medio 2-bracteatis, 0.8—1.5 cm. longis; calyx turbinatus, segmentis patentibus oblongo-ovatis, inter se aequilongis, 0.4 cm. longis; petala abeuntia; stamina subconico-collecta, staminodiis anguste linearibus, basi ampliatis, circumdatis, filamentis albidis, apicem versus lutescentibus, basi vel medio barbatis, 0.2—0.3 cm. longis; discus annularis crenulatus; ovarium supra conico-convexum, stigmatibus subulatis setaceo-acuminatis, 0.2 cm. longis.

Cape Province: South-Western Region; exact locality unknown, but said to come, probably, from the Clanwilliam Div. Flowered for the last three years in Mrs H. S. van Zijl's garden, Claremont, near Cape Town, during September and October.

This is the first instance which has come under my observation of a *Mesembrianthemum* entirely devoid of petals.

Mesembrianthemum crateriforme, L. Bolus. *Epapillosum subcaulescens* glabrum, ramulis 2-foliatis, foliis connatis, corpusculum 3.3 cm. longum, apice 3.3 cm., basi 0.9 cm., latum formantibus, vagina 1.2—1.9 cm. longa, oblique obtusissimeque 3-quetris, apice subtruncatis, deinde rotundatis, basin versus parum angustatis, a pagina superiore visis sub-rhomboideis, glauco-viridibus laevibus; pedunculus inclusus, basi 2-bracteatus, bracteis connatis, cum vagina 0.7 cm. longa, 2 cm. longis, superne cucullatis; flos solitarius; calyx subclavatus, in tubum crateriforme ultra ovarium productus, apice tubi subconstrictus, segmentis 6, ovatis obtusis, inter se subaequilongis, 0.4—0.5 cm. longis, quattuor membranaceo-marginatis; petala numerosa pluri-seriata lineari-spathulata, e supra dimidium inferne gradatim angustata, roseo-purpurea, 0.4—1.5 cm. longa, ad 0.15 cm. lata; stamina interiora inflexa, in tubum pendentia, 0.4 cm. longa, exteriora fere erecta, 0.3 cm. longa, filamentis omnibus barbatis, cum antheris pollineque albis; discus annularis multifidus, segmentis acutis; ovarium supra planum, stigmatibus 14, radiate patentibus, ovario arcte adpressis, vix 0.1 cm. longis.

Cape Province: Vanrhynsdorp, *E. B. Watermeyer* (National Botanic Gardens, No. ³²⁷/₂₃).

Flowered at Kirstenbosch, June 1923.

The produced calyx-tube and inflexed stamens are very similar to those of *M. brevipes*, Schltr. (*Roodia digitifolia*, N.E.Br.), *M. Pillansii*, Kensit, and most of the species in the § *Bracteata*.

Mesembrianthemum cyathiforme, L. Bolus (§ *Haworthiana*). Glabrum, ad 22 cm. altum vel ultra, ramis fere erectis, internodiis 1.5 cm.—2.5 longis; folia patentia vel decurvata, subflaccida, juniora adscendentia, vix con-

nata, dorso rotundata, apicem versus obscure carinata, supra plana vel basin versus concava, acuta, dilute viridia, laevia, 2.5—3.2 cm. longa, ad 0.4 cm. lata diametroque; flores 5-meri, meridie expansi, ad 4.4 cm. diam., solitarii vel apice ramulorum 3-nati, pedunculis teretibus, 1.5—5 cm. longis, medio 2-bracteatis, bracteis a foliis non differentibus; calycis tubus cyathiformis, ad 1.4 cm. longus, apice ad 1 cm. latus, segmentis inter se valde inaequalibus, ovatis acuminatis, 0.5—1.4 cm. longis, tribus ampliate membranaceo-marginatis; petala 3-seriata lineari-spathulata obtusa, integra vel inaequaliter 2-dentata, roseo-purpurea, basin versus alba, ad 2 cm. longa, 0.3—0.4 cm. lata, intima linearia pallida, 0.8 cm. longa; stamina sat pauca, collecta incurvata, staminodiis filiformibus pallidis, basi barbatis, circumdata, 0.3 cm. diam. metientia, filamentis albis, basi barbatis, 0.4—0.6 cm. longis, antheris pollineque dilute luteis; discus annularis crenatus; ovarium supra convexum 5-lobum, stigmatibus suborbicularibus setaceo-apiculatis luteo-viridibus, 0.2 cm. longis; capsula supra purpurascens, 1.3 cm. diam.

Cape Province: exact locality unknown (Bolus Herbarium, No. 17255).

Described from living specimens which flowered in Miss Arbuthnot's garden, Wynberg, September 1922.

Mesembrianthemum explanatum, L. Bolus. *Epapulosum glaberrimum* caulescens, ramis elongatis reptantibus, 45 cm. longis vel ultra, vix ad 0.2 cm. diam., internodiis 1.5—3.5 cm. longis, ramulis floriferis erectis, 1—8 cm. longis, dense foliatis; folia adscendentia vel suberecta connata, vagina ad 0.15 cm. longa, seniores fere semi-teretia, juniores plus minusve obtuse carinata, acuta glauco-viridia, ad 2.3 cm. longa, 0.2 cm. lata diametroque; flores 5-meri, solitarii vel rarius 2-nati, meridie expansi, 4.4 cm. diam., pedunculis medio 2-bracteatis, 1.5—3.5 cm. longis; calyx clavatus, segmentis inter se subaequilongis lanceolatis acutis, intimis late membranaceo-marginatis, 0.5—0.6 cm. longis; petala pluri-seriata, exteriora lineari-spathulata acuta, interiora linearia acuminata, omnia utrinque laete lutea, ad 2.1 cm. longa, 0.2 cm. lata; stamina explanata, in diam. 1.6 cm. metientia, filamentis stramineis ebarbatis, 0.2—0.7 cm. longis, antheris luteis; discus inconspicuus subannularis; ovarium supra leviter convexum, stigmatibus crassis subulatis setaceo-acuminatis luteis, 0.25 cm. longis.

Cape Province: South-Western Region; Cape Flats (National Botanic Gardens); Cape Peninsula, slopes of Muizenberg, above Lakeside, fl. Sept., *M. M. Page* (Bolus Herbarium, No. 15200); Somerset West Div., Somerset Strand, fl. Oct., *M. M. Page* (Bolus Herbarium, No. 15201).

Mesembrianthemum angustipetalum, L. Bolus. *Epapulosum glaberrimum*

caulescens, ad 12.5 cm. altum, ramis adscendentibus vel diffusis, ramulis floriferis 4-foliatis; folia sat pallide viridia laevia connata, turgide 3-quetra, carina obscura, inferiora apice subrecurva, ad 1.4 cm. longa, vagina 0.6 cm. longa, superiora acuta apiculata, lamina 1.8 cm. longa, 0.4 cm. lata diametroque, vagina ad 0.9 cm. longa; flores solitarii 5-meri, per totam diem expansi, etiam per noctem vix clausi, 4.6 cm. diam., pedunculo tereti, basin versus 2-bracteato, bracteis 2.3 cm. longis sine vagina 0.6 cm. longa; calycis tubus subcrateriformis viridi-punctatus, 0.4 cm. longus, 0.8 cm. diam., segmentis lineari-lanceolatis vel oblongis acuminatis, 1.1—1.7 cm. longis; petala angusta, laxe disposita, inter se subaequilonga, linearia, acuta vel rarius subobtusa, alba vel pallide rosea, ad 2.1 cm. longa, 0.1—0.15 cm. lata; stamina conico-collecta, staminodiis numerosis albidis, superne luteis vel pallidissime roseis, circumdata, cono circa 1 cm. alto, filamentis pallidis, parce barbatis, 0.4—0.8 cm. longis; discus inconspicuus annularis, obscure crenulatus; ovarium supra fere planum vel interdum leviter convexum, stigmatibus 10, linearibus, longe attenuatis, 1 cm. longis, demum ultra stamina bene exsertis.

Cape Province: South-Western Region; Clanwilliam Div., fl. July 1923, *Dorothy van Zijl* (Bolus Herbarium, No. 15199).

Mesembrianthemum diutinum, L. Bolus. Epapillosum glaberrimum caulescens, ramis elongatis, nodis radicanibus, ramulis floriferis adscendentibus vel erectis, compressis, anguste alatis, sine pedunculo saepius 3.5—8 cm. longis, internodiis 1—2.5 cm. longis; folia adscendentia vel patentia, interdum subfalcata, connata, vagina ad 0.15 cm. longa, 3-quetra, e medio superne leviter dilatata, acuta purpureo-apiculata viridia laevia, ad 2 cm. longa, 0.25 cm. lata, 0.35 cm. diametroque; flores 5-meri solitarii vel 2-nati, meridie expansi, ad 4.8 cm., saepius 4 cm., diam., pedunculis medio 2-bracteatis, 3—6 cm., rarissime 1.5 cm., longis; calyx subclavatus, tubo 0.6 cm. longo, segmentis ovato-oblongis, inter se subaequilongis, 0.5—0.6 cm. longis, intimis late membranaceo-marginatis, membranis brunneis; petala pluri-seriata, exteriora spathulata, apice irregulariter denticulata, roseo-purpurea, 1.8—2 cm. longa, fere ad 0.3 cm. lata, interiora pauca linearia, acuminata vel acuta, 0.7—1.3 cm. longa; stamina erecta vel subdiffusa, in diam. 0.7 cm. metientia, filamentis albis ebarbatis, 0.2—0.4 cm. longis, antheris polilineque luteis; discus conspicuus annularis, obscure crenulatus; ovarium supra planum, stigmatibus subulatis crassis, 0.2 cm. longis.

Cape Province: South-Western Region; Riversdale Div., *Dr J. Muir*, 2670 (National Botanic Gardens, No. $\frac{1587}{14}$).

This species has flowered at Kirstenbosch for the last nine years. It has a long flowering-period, from July to November, and remains open

until later in the day than many other species. The name, *divinum*, refers to these characteristics.

Mesembrianthemum politum, L. Bolus (§ *Bracteata*). Erectum glaberrimum, 18—25 cm. altum; rami adscendentes substricti, 2.5—12 cm. longi, internodiis 1—2 cm. longis; folia adscendentia connata, vagina 0.2 cm. longa, 3-quetra, supra plus minusve concava, acuta vel acuminata, interdum apiculata, apiculo recurvato, polita luteo-viridia, 1.5—2 cm. longa, 0.3—0.5 cm. lata diametroque; flores 5-meri solitarii, ad 2 cm. diam.; pedunculi 0.8—1 cm. longi, bracteis foliis simillimis, fere basi calycis positus; calyx cylindricus, basin versus attenuatus, tubo ultra ovarium producto leviterque constricto, 5-angulatus, angulis duobus acutis, ceteris obtusis vel rotundatis, 0.8—1 cm. longus, sine segmentis duobus foliaceis, ad 0.7 cm. longis, tribus ampliate membranaceo-marginatis, 0.5—0.6 cm. longis; receptaculum intra dilatatum, supra ovarium extendens; petala laxa pluri-seriata linearia, acuta vel acuminata, intima obtusa in staminodia transeuntia, rosea, 0.3—0.9 cm. longa, 0.1 cm. lata vel parum latiora; staminodia conferta, apicem versus erecta, exteriora alba, limpidè papillata, teretiuscula, acuta vel subobtusata, interiora purpurea setaceo-acuminata, ad 0.2 cm. longa; stamina pauca incurvata, itaque antherae supra stigmata dependentes, filamentis purpureis, antheris orbicularibus, cum polline, albidis; discus inconspicuus annularis; ovarium supra planum, stigmatibus subulatis setaceo-acuminatis, vix 0.1 cm. longis; capsula demum obconicum, 5-angulatum, ad 1 cm. diam.

Cape Province: South-Western Region; Ladismith Div., Muiskraal, alt. 1400 ft., fl. Sept. 1923, *Dr John Muir* (Bolus Herbarium, No. 17417).

Distinguished from all the other species of the section *Bracteata* by the polished leaf-surface.

Mesembrianthemum Henricii, L. Bolus. Epapillosum glabrum, fruticosum, ramis adscendentibus rigidis, ad 25 cm. longis, 0.4 cm. diam., ramulis floriferis gracilibus, 1—4 cm. longis; folia connata, vagina 0.1 cm. longa, subfalcata, subclavata, turgide triquetra vel carina plus minusve obscura, glauco-viridia laevia, ad 0.9 cm. longa, 0.25 cm. lata, 0.3 cm. diametroque; flores 5-meri, solitarii vel 2-nati vel rarius 3-nati, meridie expansi, 1.2 cm. diam., pedunculis gracilibus, omnibus medio 2-bracteatis, lateralibus 0.5 cm. longis, mediano ad 0.8 cm. longo; calyx subturbinatus, basi fere truncatus, circa 0.25 cm. diam., tubo 0.35 cm. longo, apice subconstricto, segmentis inter se aequilongis, lanceolatis vel ovato-lanceolatis, acutis, 0.4 cm. longis, interioribus late, exterioribus anguste, membranaceo-marginatis; petala pluri-seriata roseo-purpurea, basin versus pallidiora, marginibus saturatis, inter se subaequilonga, 0.5 cm. longa, 0.15 cm. lata; stamina non bene visa, ? conferta, filamentis superne purpureo-notatis, parum infra medium barbatis, antheris pallidis; discus prominens

annularis luteo-viridis partitus, segmentis acutis; ovarium supra convexum, 0.3 cm. diam., stigmatibus erectis lineari-filiformibus, 0.15 cm. longis.

Cape Province: South-Western Region; Clanwilliam Div., Koudeberg, near Wupperthal, alt. ca. 3000 ft., fl. Oct., *H. Bolus*, 9006. Karroo Region; Witteberg, near Matjesfontein, *R. H. Compton* (National Botanic Gardens, No. $\frac{762}{23}$).

Mesembrianthemum saturatum, L. Bolus. Epapulosum glaberrimum caulescens erectum, circa 25 cm. altum, e basi ramosum, ramis adscendentibus, inferne dense, superne laxe, foliatis, internodiis 1.5 cm. longis vel brevioribus, ad 4.5 cm. longis; folia adscendentia vel late patentia connata, vagina ad 0.25 cm. longa, vel juniora fere discreta, seniora semiteretia vel fere teretia, juniora plus minusve obtuse carinata, supra plana, omnibus acuta laevissima subflaccida glauco-viridia, ad 4 cm. longa, 0.4—0.5 cm. lata, ad 0.6 cm. diam.; flores solitarii 5-meri, meridie expansi, ad 5.6 cm. diam., pedunculis medio bracteatis 5—9 cm. longis; calyx clavatus, tubo 1 cm. longo, segmentis lanceolatis acuminatis, intimis late membranaceo-marginatis, 1.1—1.6 cm. longis; petala pluri-seriata, laetissime roseo-purpurea, subtus et basin versus pallidiora, spathulata, apice obscure denticulata, 2.6 cm. longa, ad 0.4 cm. lata, interiora linearia acuminata; stamina diffusa, in diam. 1.3 cm. metientia, filamentis saturate rubris, 0.5—0.9 cm. longis, intimis dense barbatis, antheris pollineque luteis; discus obscurus annularis; ovarium supra elevatum, apice subtruncatum, profunde 5-lobum, lobis medio longitudinaliter sulcatum, stigmatibus crassis subulatis setaceo-acuminatis, vix 0.25 cm. longis.

Cape Province: exact locality uncertain, but said to come from Vanrhynsdorp Div. Comm. *Mrs H. S. van Zijl*, July 1923.

Described from cultivated specimens. The name refers to the deep colouring of the filaments.

Mesembrianthemum Marianae, L. Bolus. Epapulosum glaberrimum caulescens suffruticosum, circa 31 cm. altum vel ultra; folia adscendentia connata, vagina 0.7—1.5 cm. longa, vix tumidula, turgide 3-quetra subacuta apiculata, angulis integris, glauco-viridia laevia, 5—10 cm. longa, 0.4—0.7 cm. lata; flores 5-meri, 3-nati vel bi-ternati, meridie expansi, 4 cm. diam., pedunculis omnibus bracteatis, bracteis concavo-cucullatis, late membranaceo-marginatis, 1.3 cm. longis; calyx turbinatus, tubo 0.6 cm. longo, segmentis omnibus membranaceo-marginatis ovato-oblongis, 0.7—1 cm. longis, ca. 0.8 cm. latis; petala multi-seriata obovato-spathulata, inter se fere aequilonga, vel 2—3 minoribus, 1.2—1.5 cm. longis additis, lacerato-denticulata, splendide coccinea, ad 1.9 cm. longa, 0.5 cm. lataque; stamina collecta, apicem versus leviter patentia, apice

0.7 cm. diam. metientia, filamentis rubris ebarbatis, antheris pollineque aureis, 0.5—0.9 cm. longis; discus inconspicuus annularis crenulatus; ovarium supra convexum, distincte 5-lobum, stigmatibus erectis subulatis acuminatis, 0.4 cm. longis.

Cape Province: Western Region; Nieuwoudtville. Flowered in Dr R. Marloth's garden, Cape Town, July 1923.

A remarkably beautiful species, whose broad, bright scarlet petals serve to distinguish it from its allies in the § *Tumidula*. Named after Mrs R. Marloth, an ardent cultivator of South African plants.

Mesembrianthemum cymosum, L. Bolus (§ *Tumidula*). Glabrum, 20—40 cm. altum vel ultra, crebre ramosum; rami rigidi, ad 0.4 cm. diam., internodiis 2.5—4 cm. longis, ramulis saepius 4—6-foliatis, axillis gemmiferis, superne pedunculoideis; folia adscendentia, saepius fere erecta, apicem versus haud recurva, dorso rotundata, supra leviter convexa, sat abrupte acuta, obscure apiculata, glauco-viridia, 2—4.5 cm. longa, ad 0.4 cm. lata diametroque, vagina ad 0.5 cm. longa; flores 5-meri numerosi, meridie expansi, 1.8—2 cm. diam., in cymam latam, ad 12 cm. diam., saepius 4-furcatam, dispositi, ramis senioribus rigide patentibus, junioribus adscendentibus, pedunculis persistentibus, induratis vel etiam subspinescentibus, ultimis 1—2 cm. longis, omnibus 2-bracteatis, bracteis patentibus connatis crassis obtusis, 0.3—1 cm. longis; calyx turbinatus, segmentis inter se subaequilongis, ovato-lanceolatis acutis, ad 0.4 cm. longis, tribus ampliate membranaceo-marginatis; petala 1-seriata lineari-spathulata integra purpureo-rosea, ad 0.8 cm. longa, 0.1—0.15 cm. lata; stamina subdiffusa, 0.4—0.5 cm. diam. metientia, filamentis dilute roseis, basi barbatis, 0.15—0.3 cm. longis, antheris pallidis, polline luteo; discus annularis crenulatus; ovarium supra convexum, stigmatibus subulatis, longe attenuatis, 0.2 cm. longis.

Cape Province: South-Western Region; Montagu Div., Montagu Baths, very common, fl. Oct. 1921, *M. M. Page* (Bolus Herbarium, No. 17168). Oudtshoorn Div., The Brook, near Oudtshoorn, fl. Dec. 1905, *H. Bolus*, 11903.

Mesembrianthemum Lerouxiae, L. Bolus. Epapulosum caulescens glabrum, ramis decumbentibus vel subadscendentibus, 0.3 cm. diam., internodiis 1.5—3 cm. longis, ramulis fere erectis compressis, anguste alatis, 2—4-foliatis; folia fere erecta connata, vagina sat tumidula, 0.3—0.5 cm. longa, triquetra vel turgide 3-quetra, acuta apiculata, supra plana, laevia glauco-viridia, ad 6 cm. longa, 0.4—0.8 cm. lata, 0.6—0.8 cm. diam.; flores 5-meri, die expansi, ad 5.6 cm. diam., 3-nati, pedunculis in calycem gradatim abeuntibus, 3—6 cm. longis, omnibus medio 2-bracteatis, bracteis foliis multo minoribus, basi concavis, 1.1—1.7 cm. longis; calyx turbinatus, tubo 0.5—0.6 cm. longo, segmentis lanceolatis acutis, inter

seleviter inaequalibus, 0·8—1 cm. longis, tribus membranaceo-marginatis; petala pluri-seriata lineari-spathulata obtusa, integra vel interiora irregulariter dentata, purpureo-rosea, inferne obscure purpureo-vittata, 1·8—2·5 cm. longa, 0·2—0·3 cm. lata; stamina subdiffusa, 1 cm. diam. metientia, mox late diffusa, 1·6 cm. diam. metientia, filamentis rubro-purpureis, interioribus barbatis, 0·4—0·7 cm. longis, antheris polineque laete luteis; discus annularis crenatus; ovarium supra conico-convexum, profunde lobatum, stigmatibus rubro-brunneis vel viridibus, subulatis vel subulato-lanceolatis, 0·25—0·3 cm. longis.

Cape Province: Namaqualand: Nababeep, fl. Aug. (1923), *Mrs Olive le Roux* (Bolus Herbarium, No. 15197).

Mesembrianthemum intermedium, L. Bolus (? § *Aspericaulia*). Rami gracillimi elongati flexuosi reptantes, nodis insigne incrassatis, brevissime hispiduli, demum glaberrimi vel etiam politi, internodiis 0·8—5 cm. longis, ramulis floriferis, cum flore, 2—5 cm. longis; folia minute papillosa gracillima, fere erecta, connata, vagina 0·1 cm. longa, supra leviter concava, dorso rotundata, acuta, interdum apice recurvata, 0·7—1·5 cm. longa, saepius 0·1 cm. diam.; flores 5-meri, meridie expansi, solitarii, ad 2·5 cm. diam., pedunculis brevissime papilloso-hispidulis, 0·7—1·5 cm. longis; calyx turbinatus, tubo brevissime papilloso-hispidulo, segmentis inter se subaequilongis, lanceolatis vel ovato-lanceolatis, 0·4 cm. longis, tribus membranaceo-marginatis; petala inter se subaequilonga, linearia obtusa roseo-purpurea, subtus saturatiora, 1·1 cm. longa, ad 0·2 cm. lata; stamina conico-collecta, in diam. 0·2 cm. metientia, filamentis inferne albidis barbatis, superne purpurascens, 0·2—0·3 cm. longis; discus conspicuus, e glandulis 5 trilobulatis compositus; ovarium supra conico-convexum, stigmatibus subulatis, longe setaceo-attenuatis, stamina bene excedentibus, 0·4 cm. longis.

Cape Province: South-Western Region; Mossel Bay Div., Mossel Bay, fl. Aug., *F. A. Rogers*, 4248, 2031; hills near Gouritz River, *Dr John Muir*, 986. Riversdale Div., in sand at Zwartklip, near Albertinia, *id.*

This is intermediate between the two sections, *Aspericaulia* and *Hispida*, having the habit of growth of the latter but with the papillae of the former.

Mesembrianthemum aberdeenense, L. Bolus (§ *Crassulina*). Humile, minute papillosum, papillis in setam patentem abeuntibus, ob has omnibus partibus herbaceis pubescentibus, ramis confertis, demum diffuse decumbentibus, hispidis glabrescentibus, internodiis 1—2·5 cm. longis; folia adscendentia, dorso rotundata, supra plana, acuta, 0·4—2 cm. longa, ad 0·5 cm. lata diametroque; flores 5-meri, die expansi, 3-nati, 1·5 cm. diam., pedunculis 0·4—1 cm. longis, lateralibus infra medium bracteatis; calycis tubus crateriformis, segmentis lanceolatis acutis, inter

se subaequilongis, 0·5 cm. longis, tribus membranaceo-marginatis; petala pluri-seriata linearia obtusa, basin versus parum angustata, rubro-purpurea, 0·6 cm. longa, ad 0·1 cm. lata, interiora in staminodia gradatim abeuntia; stamina collecta incurvata, staminodiis apice recurvatis circumdata, filamentis inferne pallidis, superne purpurascentibus, interioribus barbatis, ad 0·2 cm. longis, antheris luteis; discus e glandulis 5, transverse linearibus, compositus; ovarium supra planum, sine medio vero parum elevato, stigmatibus subulatis, longe setaceo-acuminatis, 0·15 cm. longis; capsula 0·7 cm. diam.

Cape Province: Karroo Region; Aberdeen Road, *F. Frith* (National Botanic Gardens, No. $\frac{436}{18}$).

Described from living specimens which have flowered for several years at Kirstenbosch during December and January.

Erica Nevillei, L. Bolus (§ *Pleurocallis*), *E. purpureae* affinis, sed pedunculis longioribus, corolla supra ovarium constrictum, antheris terminalibus, ceterisque differt.

Fruticulus robustus humilis, ad 32 cm. altus vel ultra in locis protectis, ramis decumbentibus vel ad saxa adpressis; folia adscendentia vel patentia, 5-nata vel rarissime 6-nata, dense imbricata linearia acuta, angustissime sulcata, glabra, 0·9—1·4 cm. longa, 0·1 cm. lata, petiolo 0·15 cm. longo, internodiis 0·2—0·5 cm. longis; pedunculi adscendentes pubescentes, pilis patentibus brevissimis, cum bracteis sepalis corollaque viscidis, ad 1·2 cm. longi; bracteae 3, lineares, infima supra medium posita, 0·3 cm. longa, superiores calyci adpressae, 0·5 cm. longae; sepala foliacea subulata, 0·5—0·65 cm. longa; corolla tubiformis subobliqua, supra ovarium constricta, superne gradatim ampliata, rubra, 2·5 cm. longa, faucibus 0·5 cm. diam., segmentis demum subpatentibus, late ovatis, 0·3 cm. longis; antherae subexsertae vel saepe demum exsertae, terminales oblongo-lineares acutae, basi obliquae, muticae, lobis ad basin distinctis divergentibus, poro dimidio lobi aequilongo, 0·25 cm. longae; ovarium subpyriforme glabrum, 0·3 cm. longum, stylo exserto capitellato.

Cape Province: South-Western Region; Cape Peninsula, south-western slopes of Noord Hoek Mountain, fl. Jan.—Feb., *Neville S. Pillans*, 4124.

Allied to *E. purpurea*, but may be distinguished by the longer peduncles, corolla constricted above the ovary, terminal anthers, and in other ways.

Erica quadrisulcata, L. Bolus (§ *Pleurocallis*), *E. Nevillei* affinis, sed sepalis angustioribus longioribusque, corolla basin versus profunde 4-sulcata, stylo basin versus dilatato, facile disarticulato, differt.

Fruticulus robustus humilis, ad 25 cm. altus; ramisae pius decumbentis, ad 37·5 cm. longi, 0·4 cm. diam.; folia adscendentia vel patentia, rite

5-nata, rarius 4-nata, dense imbricata, linearia acuta, angustissime sulcata, glabra, lamina ad 1.4, saepius 1.1 cm., longa, petiolo 0.2 cm. longo; flores in 1—3 verticillos apice ramulorum dispositi; pedunculi adscendentes, minute pubescentes, 0.6 cm. longi; bracteae 3, approximatae vel infima interdum medio posita, foliis simillimae, 0.7—0.8 cm. longae; sepala e basi lato (0.2 cm.) linearia acuminata, 1 cm. longa; corolla tubiformis subobliqua, basin versus acute tetragona, 2.8 cm. longa, cum segmentis patentibus rotundatis, 0.3 cm. longis; antherae inclusae terminales lineares obliquae subacutae, lobis ad basin distinctis, denticulatis, 0.25 cm. longis, poro dimidium parum excedente; ovarium 4-loculare cylindricum glabrum, 0.4—0.45 cm. longum, stigmate exserto capitellato.

Cape Province: South-Western Region; Cape Peninsula, neck between Signal Mountain and Zwart Kop, Klaver Valley, near Simonstown, fl. Jan., *N. S. Pillans*, 3944.

Allied to *E. Nevillei*, L. Bolus, but differs in having longer and narrower sepals, corolla deeply grooved towards the base, and the style thickened towards the base and disjointing readily.

Described from two specimens.

Erica fervida, L. Bolus (? § *Evanthe*). Erecta, ramis adscendentibus virgatis pubescentibus, ad 32 cm. longis, ramulis floriferis, saepius 0.5 cm., rarius ad 2 cm., longis; folia fere erecta vel patentia imbricata 4-nata linearia acuta, sulco angustissimo, breviter pubescentia, ad 0.3 cm. longa, sine petiolo 0.2 cm. longo; flores 1--4-nati, breves laterales ramulos terminantes, inflorescentiam densam, ad 14 cm. longam, formantes; pedunculi adscendentes vel leviter decurvati, pubescentes, 0.2 cm. longi; bracteae 3 lineares, remotae vel superiores medio positae, ad 0.1 cm. longae; sepala ovata vel oblongo-obovata acuta, breviter pubescentia, rubra, 0.2 cm. longa; corolla tubiformis, faucibus vix contracta, sat quadrangularis, angulis rotundatis, brevissime denseque pubescens, laete rubra, ad 0.7 cm. longa, segmentis 0.2 cm. longis; antherae manifestae dorsifixae oblongae, ca. 0.1 cm. longae, aristatae, aristis poroque dimidium lobi parum excedentibus, filamentis rubris; ovarium subobovatum e medio superne dense villosum, pilis erectis albidis, stylo corollae aequilongo vel parum brevior, stigmate capitellato.

Cape Province: South-Western Region; ? Caledon Div., sold in Cape Town, fl. Oct., *Bolus*, 13408.

This has the same glowing, or fervid, red colour of *E. Pillansii*, Bolus, both of the calyx and corolla, and is remarkably like it in other ways. The distinction lies in the corolla, which is much shorter, somewhat tetragonous and quite symmetrical (*i.e.* without the curve which many of the ornithophilous heaths have). The corolla-lobes are relatively longer and the sepals proportionately broader.

Erica coruscans, L. Bolus (§ *Euryloma*). Rami stricti vel substricti, glabri, 11–17 cm. longi; folia erecto-patentia, dense imbricata, 4-nata linearia viscidula glabra, sat distanter ciliata apiceque penicillata, pilis longis (ad 0.3 cm. longis) griseis, e tuberculis parvis orientibus, 0.5–0.7 cm. longa, cum petiolo ad 0.2 cm. longo, ad 0.2 cm. lata; flores 12–16, apice ramorum aggregati; pedunculi pilis adscendentibus longis albidis dense vestiti, 0.7 cm. longi; bractee 3, lineares glabrae, dense ciliatae, pilis longis, infima parum infra medium posita, ceterae subapproximatae, 0.8–0.9 cm. longae; sepala linearia acuta glabra, conspicue penicillata, rubescentia, ad 0.7 cm. longa; corolla ampullacea viscidissima coruscansque, tubo purpureo-rubro, colore saturatiore faucibus cincta, ad 2.8 cm. longa cum lobis stellato-patentibus, pallide roseis, 0.35 cm. longis; antherae inclusae dorsifixae ovato-oblongae muticae, pallide brunneae, 0.22 cm. longae, filamentis apicem versus conspicue dilatatis, tubo corollae fere aequilongis, poro dimidium lobi aequante; ovarium elongatum stipitatum glabrum, 0.35 cm. longum sine stipite 0.4 cm. longo, stylo tubo corollae parum longiore, stigmatibus capitellato.

Var. β , minor. Corolla 1.8 cm. longa, ceteraeque partes minores.

Cape Province: South-Western Region; Caledon Div., Klein River Mountains, near Stanford, fl. July 1920, *T. P. Stokoe* (Bolus Herbarium, No. 16944). Var. β , near the summit of the Klein River Mountains, alt. 2500–3000 ft., *id.* (*id.* No. 16202).

Erica Eylesii, L. Bolus (§ *Pyronium*). Rami sat graciles, pilis simplicibus ramentaceisque pubescentes, ad 20 cm. longis, ramulis floriferis ad 1.5 cm. longis; folia erecta vel fere erecta, internodiis aequilonga vel parum longiora, 3-nata lineari-lanceolata, cum sepalis bracteisque distanter ciliata, pilis saepe ramentaceis, sulco angusto vel subaperto, 0.1–0.15 cm. longa; flores 3-nati vel abortione 1–2-nati, inflorescentiam densam, 12 cm. longam, apice ramorum formantes; pedunculi graciles pubescentes, pilis simplicibus ramentaceisque, ad 0.4 cm. longi; bractee 3, infra medium, vel superiores medio, posita, ad 0.15 cm. longae, sepala ovato-lanceolata, apice saepe pilo glandulifero onusta, 0.2 cm. longa; corolla cyathiformis, faucibus leviter contracta, glabra, 0.4 cm. longa, segmentis obtusis, 0.1 cm. longis; antherae subexsertae vel demum exsertae, dorsifixae ovato-oblongae, basi leviter obliquae, ca. 0.1 cm. longae, anguste cristatae, cristis poroque dimidio lobi subaequilongis; ovarium depresso globosum villosum, pilis erectis, stylo bene exserto, stigmatibus capitellato.

Rhodesia: Melsetter, fl. Oct. 1920, *F. Eyles*, 2755.

Erica cincta, L. Bolus (§ *Ephebus*). Fruticulus erectus, ad 24 cm. altus, e basi ramosus, ramis ramulisque adscendentibus glabris viscidulis elongatis ad 14 cm. longis, floriferis ad 4 cm. longis; folia saepius erecto-patentia

imbricata 3-nata linearia acuta apiculata, anguste sulcata, viscida glabra, cum bracteis sepalisque pectinato-ciliata, ciliis glanduliferis, 0.3—0.4 cm. longa cum petiolo 0.1 cm. longo; flores 3-nati, vel saepius 6-nati, quasi ramulos terminantes; pedunculi plus minusve pubescentes, pilis crispulatis, glanduliferis interjectis, ad 0.5 cm. longis; bracteae 3, infima infra medium, ceterae supra medium, positae, cum sepalis corollae viscidae, ad 0.25 cm. longae; sepala linearia rubra, 0.25 cm. longa; corolla globoso-urceolata pubescens, albida vel dilute rosea, faucibus rubro-cincta, 0.4 cm. longa, segmentis erecto-patentibus, ca. 0.1 cm. longis; antherae inclusae dorsifixae subovatae, basi obliquae, pallide brunneae, breviter aristatae, aristis basin versus de filamentis decurrentibus, poro dimidium lobi excedente; ovarium obovatum stipitatum glabrum, stylo corolla parum brevior, stigmate capitellato.

Cape Province: South-Western Region; Hottentotsholland Mountains, Kogelberg, alt. 3500 ft., fl. Jan., *T. P. Stokoe* (Bolos Herbarium, No. 17201).

Erica fontana, L. Bolus (§ *Ephebus*). Fruticulus erectus, 23—35 cm. altus, ramis ramulisque adscendentibus, junioribus cano-pubescentibus, floriferis ad 2.2 cm. longis; folia saepissime fere erecta, dense imbricata, 4-nata linearia acuta, anguste sulcata, tenuiter cano-pubescentia, 0.4—0.6 cm. longa; flores saepius solitarii, rarius 2-nati; pedunculi pubescentes, ad 0.2 cm. longi; bracteae 3, infima basali, ceterae remotae, suprema longissima, pedunculo aequilonga; sepala e basi lato linearia acuta pubescentia, 0.3—0.4 cm. longa; corolla tubiformis pubescens, pilis brevissimis, dilute rosea, 0.8—1 cm. longa, lobis ovatis subacutis, 0.1—0.18 cm. longis; antherae inclusae dorsifixae muticae suboblongae obtusae, 0.1 cm. longae, poro lobi dimidium aequante; ovarium subcylindricum, breviter stipitatum, glabrum, stylo exserto, basin versus dilatato, stigmate capitellato.

Cape Province: South-Western Region; Cape Peninsula, marshy ground, plateau 1 mile west of Buffels Bay, fl. Nov., *N. S. Pillans*, 4115.

This may be readily distinguished from *E. cyrillaeflora*, Salisb., by its more robust and erect habit, longer sepals and corolla, exserted style, and by other characters.

Erica limosa, L. Bolus (§ *Ephebus*). Fruticulus gracillimus, 50—75 cm. altus, ramis ramulisque adscendentibus flexuosis filiformibus, glabris vel minute pubescentibus; folia saepius recurvata, rarius patentia vel adscendentia, 3-nata, linearia acuta, glabra vel parce pubescentia, anguste sulcata, 0.3—0.4 cm. longa, internodiis foliis brevioribus vel ad 1.2 cm. longis; flores solitarii, rarius 2-nati, breves ramulos, saepius decurvatos, terminantes; pedunculi glabri, ca. 0.1 cm. longi; bracteae 3, infima basali, ceterae remotae, pedunculo breviores; sepala late ovata acuminata glabra ciliata, pilis glanduliferis interjectis, 0.1 cm. longa;

corolla crateriformis, parce pubescens, dilute rosea, 0.25 cm. longa, tubo inconspicue quadrisulcato, segmentis patentibus, late ovatis, tubo fere aequilongis; antherae inclusae vel manifestae, dorsifixae muticae oblongae, basi subprolatae, obtusae, poro dimidio lobi minore; ovarium depresso globosum glabrum, stylo corolla multo brevior, stigmate capitellato.

Cape Province: South-Western Region; Cape Peninsula, Steenberg, "plentiful among Restionaceae and other plants in the marsh above the reservoir," fl. Oct., *N. S. Pillans*, 4108.

Erica paludicola, L. Bolus (§ *Ephebus*). Fruticulus gracillimus, ad 1 met. altus vel ultra, saepius 0.2—0.3 met. altus, ramis adscendentibus, cum ramulis filiformibus, glabris brunneis; folia adscendentia, patentia vel recurvata, rite 3-nata, anguste linearia, acuta glabra, 0.3—0.5 cm. longa, sine petiolo 0.05 cm. longo, internodiis saepius foliis parum brevioribus; flores solitarii vel rarius 2-nati, sat pauci, ramulos laterales breves terminantes; pedunculi minute pubescentes, 0.2 cm. longi; bracteae 3, minutae, infima basalis, superiores parum supra basin positae; sepala subulata acuta, minute pubescentia, 0.2 cm. longa; corolla cyathiformis, breviter parceque pubescens, rosea, 0.5 cm. longa, cum segmentis erectis, late ovatis, obtusis, 0.15 cm. longis; antherae inclusae dorsifixae muticae ovato-oblongae acutae, scaberulae, saturate brunneae, 0.12 cm. longae, poro minore dimidio lobi; ovarium subobovatum glabrum, 0.12 cm. longum, stigmate exserto capitellato.

Cape Province: South-Western Region; Cape Peninsula, marshy ground, middle part of Silver Mine Valley, fl. March, *N. S. Pillans*, 4126.

Described from several dried specimens. The general appearance of the plant is similar to that of *E. cyrillaeflora*, Salisb., from which, however, it differs in several respects.

Erica utriculosa, L. Bolus (§ *Ceramia*). Nana, e basi ramosa, interdum caespitosa, ramis decumbentibus vel prostratis, pubescentibus, pilis glanduliferis intermixtis, ad 8 cm. longis, internodiis 0.1—0.7 cm. longis; folia saepius patentia 3-nata utriculoso-inflata, suborbicularia vel ovata vel oblongo-ovata, marginibus veris recurvatis, breviter denseque ciliatis, falsis distanter glanduloso-ciliatis, interdum paucis pilis glanduliferis pagina sparsis, aliter glabra, 0.2—0.3 cm. longa, sine petiolo ad 0.1 cm. longo; flores rite 3-nati, saepius solitarii vel 2-nati, apicem versus ramorum dispositi; pedunculi brevissime pubescentes, glandulis stipitatis interjectis fere ad 0.5 cm. longi; bracteae 3, parvae, infima basali, ceterae infra medium positae; sepala ovato-lanceolata acuta glanduloso-ciliata, 0.2 cm. longa; corolla subcyathiformis, obscure tetragona, glabra, cum lobis brevibus obtusis 0.25 cm. longa; antherae inclusae dorsifixae sub-

ovatae, basi conspicue obliquae, aristatae, aristis poroque dimidio lobi aequilongis; ovarium subglobosum, apicem versus hispidum, stylo exserto, stigmatе simplice.

Cape Province: South-Western Region; Caledon Div., "in shaded damp rock-crevices," near Stanford, fl. April, *T. P. Stokoe* (Bolus Herbarium, No. 15935).

Allied to *E. physophylla*, Benth., but distinguished by having shorter hairs on the leaves, longer peduncles, two bracts, both being remote and much smaller, exserted style, and hispid ovary.

Erica saxatilis, L. Bolus (§ *Orophanes*). Nana gracilis, 8—12 cm. alta, ramis ramulisque adscendentibus pubescentibus, ad 4 cm. longis; folia patentia vel adscendentia, 4-nata, dense imbricata, lineari-lanceolata griseo-pubescentia, demum glabrescentia, saepe apice pilo glandulifero onusta, leviter inflata, sulco basin versus parum ampliato, ad 0.25 cm. longa; flores rite 4-nati, abortione pauciores; pedunculi adscendentes gracillimi pubescentes, pilis glanduliferis longioribus intermixtis, 0.4—0.6 cm. longi; bractae 3, remotae, infima subspathulata, ad 0.25 cm. longa, ceterae minores; sepala lineari-lanceolata acuta, parce pubescentia, ciliata pilis distantibus longis glanduliferis, 0.3 cm. longa; corolla tubiformis, faucibus leviter contracta; glabra, ex siccis sordide carnea, 1 cm. longa, lobis rotundatis, vix 0.2 cm. longis; antherae manifestae vel subexsertae, dorsifixae lineares acutae, basi obliquae, 0.2 cm. longae, aristatae, aristis latis, tertium lobi parum excedentibus, poro dimidio lobi minore; ovarium obovatum, apice concavum, glabrum vel apicem versus parce albo-pubescentia, stylo exserto, stigmatе capitellato.

Cape Province; South-Western Region; Ceres Div., Mitchells Peak, Mitchells Pass, "growing on rocks, rare," alt. 4500 ft., fl. Dec. 1920, *T. P. Stokoe*, 66.

Erica montana, L. Bolus (§ *Orophanes*). Rami ramulique adscendentes, fere erecti, pubescentes, ad 27 cm. longi; folia saepissime erecta, internodiis parum longioribus, 4-nata linearia acuta, anguste sulcata, glabra, 0.4—0.7 cm. longa, cum petiolo 0.1 cm. longo; flores solitarii vel 2-nati, apicem versus ramorum, ramulos perbreves terminantes, dispositae; pedunculi minute pubescentes, 0.7 cm. longi; bractae 3, infima remota, ceterae parum infra medium positae, vix 0.1 cm. excedentes; sepala lanceolata acuta, glabra vel rarius minute pubescentia, ciliata rubra, 0.2 cm. longa; corolla suburceolata glabra rosea, 0.7—0.8 cm. longa, segmentis ovatis obtusis, 0.12 cm. longis; antherae inclusae dorsifixae ovatae, 0.12 cm. longae, aristatae, aristis latis ciliatis, lobo fere aequilongis, poro tertium lobi aequante; ovarium obovatum glabrum, interdum imperfecte 8-loculare, stylo exserto, stigmatе capitellato.

Cape Province: South-Western Region; mountains between Wor-

cester and Robertson, fl. May 1919, *T. P. Stokoe* (Bolus Herbarium, No. 15940).

Erica autumnalis, L. Bolus (§ *Orophanes*). Erecta, sat robusta, ad 32 cm. alta, ramis ramulisque substrictis pubescentibus, ad 25 cm. longis; folia fere erecta vel patentia, dense imbricata, 4-nata linearia acuta, sulco obscuro, glabra vel parce pubescentia, 0.2—0.4 cm. longa sine petiolo, ad 0.1 cm. longo; flores 1—4-nati, in brevibus lateralibus ramulis dispositi, saepe inflorescentiam densam, 8—15 cm. longam formantes; pedunculi demum decurvati glabri, 0.3 cm. longi; bracteae 3, infima parum infra medium, ceterae supra medium, positae, ciliatae, 0.15 cm. longae; sepala lanceolata, longe acuminata, ciliata, foliacea vel basin versus colorata, 0.3—0.4 cm. longa; corolla suburceolata, faucibus vix contracta, glabra rosea, 0.5 cm. longa, lobis rotundatis, 0.15 cm. longis; antherae inclusae dorsifixae subovatae scaberrulae, ca. 0.075 cm. longae, aristatae, aristis latis ciliatis, lobo fere aequilongis, poro dimidium lobi aequante; ovarium obovatum glabrum purpureum, ca. 0.1 cm. longum, stylo corolla parum brevior, stigmate capitato.

Cape Province: South-Western Region; exact locality unknown, sold in Cape Town, Feb. Comm. *N. S. Pillans* (Bolus Herbarium, No. 16784).

Erica Duthieae, L. Bolus (§ *Orophanes*). Erecta, ad 30 cm. alta, ramis ramulisque adscendentibus, sat gracilibus, glabris vel junioribus tenuiter pubescentibus, ad 17 cm. longis; folia fere erecta vel rarius patentia, saepius dense imbricata, rarius internodiis elongatis, ad 1 cm. longis, 4-nati linearia acuta, apice interdum brevissime penicillata, sulco obscuro, glabra, 0.3—0.5 cm. longa, sine petiolo ad 0.1 cm. longo; pedunculi adscendentes vel decurvati glabri, ad 0.3 cm. longi; bracteae 3, infima remota, ceterae medio positae, ciliatae, ad 0.12 cm. longae; sepala ovato-lanceolata, longe acuminata, glabra, obscure ciliata, 0.2 cm. longa; corolla urceolata, faucibus leviter contracta, subtetragona glabra, 0.4 cm. longa, segmentis rotundatis, ca. 0.15 cm. longis; antherae inclusae dorsifixae subovatae, basi obliquae, ca. 0.05 cm. longae, aristatae, aristis poroque dimidio lobi aequilongis; ovarium obovatum, apicem versus hispidulum, stylo corolla parum brevior, stigmate capitellato.

Cape Province: South-Western Region; near Stellenbosch, fl. Oct., *A. V. Duthie*, 950; *S. Garside*, 1307.

This is very closely allied to *E. intervallaris*, Salisb., and is, perhaps, not more than a variety of that species.

Erica barrydalensis, L. Bolus, *E. Fairii* forsitan accedit, sed pedunculis longioribus, sepalis brevioribus, cum bracteis haud viscidis, corolla laete rubra, ceterisque differt.

Fruticulus rigidus, ramis strictis, adpresse cano-pubescentibus, pilis, praeter eos in axillis foliorum, saepius reflexis, ad 20 cm. longis, ad

0.25 cm. diam.; folia erecta 4-nata, dense imbricata, in longitudinem 8 definitas series formantia, linearia acuta sulcata, sulco angustissimo, glabra glauco-viridia, saepius 0.8 cm. longa cum petiolo 0.15 cm. longo; flores 4-nati, in ramis adscendentibus brevibus lateralibus, ad 1 cm. longis, dispositi, 4—6 foliis expansis roseis viridi-apiculatis bracteiformibus, ad 0.5 cm. longis, involucrati; pedunculi saepius decurvati, pubescentes, pilis brevissimis, 0.8—1.2 cm. longi; bracteae 3, roseo-rubrae, infima oblongo-ovata acuta, 0.7 cm. longa, parum supra dimidium posita, ceterae subapproximatae lanceolatae, 0.6 cm. longae; sepala erecta ovata roseo-rubra, 0.3—0.4 cm. longa; corolla urceolata rubra viscidissima, 0.8—0.9 cm. longa, cum segmentis patentibus rotundatis, 0.15—0.2 cm. longis; stamina inclusa, filamentis sub antheris extensis, basi conspicue dilatatis, 0.5 cm. longis, antheris linearibus subacutis aristatis, arista poroque dimidium lobi aequantibus, 0.2 cm. longis; ovarium globosum glabrum, 0.2 cm. diam., stigmatibus capitellato, apicem corollae fere attingente.

Cape Province: South-Western Region; Barrydale, mountains, fl. Aug. 1923. Comm. *G. H. Lewis* (Bolus Herbarium, No. 15198).

Erica sociorum, L. Bolus (§ Trigemma). Nana, sat robusta, ramis decumbentibus, ad 20 cm. longis, ramulis adscendentibus, minute pubescentibus, floriferis 1—4 cm. longis; folia adscendentia vel patentia recurvata, saepe falcata, dense imbricata, 3-nata linearia acuta, rigide apiculata, glabra luteo-viridia subcoriacea, sulco angustissimo, ad 0.2 cm. lata, 0.7—1.3 cm. longa sine petiolo ad 0.2 cm. longo; flores rite 3-nati vel abortione pauciores, terminales; pedunculi fere erecti, minute pubescentes, ad 0.6 cm. longi; bracteae 3, lineares acutae pallidae, ad 0.5 cm. longae, infima remota, ceterae parum infra medium positae; sepala lanceolata, longe acuminata, glabra pallida, 0.7—0.8 cm. longa; corolla subtubiformis, faucibus leviter contracta, glabra, pallidissime viridis, ad 1 cm. longa, segmentis erectis rotundatis, vix 0.1 cm. longis; antherae inclusae dorsifixae lineares acutae, basi obliquae, 0.2 cm. longae vel ultra, aristatae, aristis dimidio lobi aequilongis vel parum brevioribus, poro dimidium excedente; ovarium obovatum glabrum, stylo bene exserto, stigmatibus capitellato.

Cape Province: South-Western Region; Cape Peninsula, krantzes on south side of Noord Hoek Mountain, fl. Feb., *N. S. Pillans*, 4130; *E. L. Stephens*.

Blaeria Muirii, L. Guthrie, *B. dumosae* affinis, sed ramis puberulis, corollae lobis circa stamina conniventibus, ovario pubescente, differt.

Fruticulus ca. 35 cm. altus, ramis adscendentibus puberulis; folia erecta adpressa 3-nata lineari-oblonga glabra, marginibus hyalinis, minute ciliolatis, breviter petiolata, 0.15—0.23 cm. longa, ca. 0.07 cm.

lata; flores 1—5, apicibus brevium lateralium ramulorum dispositi; pedunculi puberuli, 0.1 cm. longi; bractee 3, glabrae ciliolatae, infima approximata, superiores calyci adpressae et eo breviores, 0.05 cm. longae; calyx 4-partitus, segmentis ovatis acutis ciliolatis pallidis, 0.1 cm. longis, ad 0.07 cm. latis; corolla urceolato-tubiformis, obtuse 4-angularis, glabra, 0.37 cm. longa, 0.14 cm. diam., 4-loba, lobis erectis obtusis, 0.05 cm. longis; stamina 4, exserta, filamentis 0.35 cm. longis, antheris atro-brunneis scaberulis, infra medium bipartitis, basin versus angustatis, aristatis, aristis divergentibus brevissimis; ovarium ovatum obtusum 4-lobum pubescens, 0.04 cm. longum, 0.02 cm. diam., loculis 1—3-ovulatis, stylo 0.55 cm. longo, stigmati simplici.

Cape Province: South-Western Region; Mossel Bay Div., foot of Goliath's Berg, alt. 1000 ft., fl. May, *Dr John Muir*, 2174.

Allied to *B. dumosa*, Wendl., but may be distinguished by its puberulous branches, connivent corolla-lobes, and pubescent ovary. It is also a larger and more robust shrub.

Philippia pallida, L. Guthrie. Fruticulus erectus, ca. 38 cm. altus, ramis adscendentibus numerosissimis, dense albo-pubescentibus, pilis patentibus vel reflexis; folia erecta 3-nata, oblonga vel ovato-oblonga, obtusa sulcata crassa glabra, minute ciliata, 0.1—0.2 cm. longa, 0.05—0.08 cm. lata; flores saepius 3-nati terminales; pedunculi dense albo-pubescentes, 0.1 cm. longi; sepala erecta, late ovata, minute ciliata, alba viridi-carinata, 0.1 cm. longa lataque, duo ceteris parum majora; corolla globosa glabra alba, 0.2 cm. longa diametroque, lobis incurvis obtusis, 0.05 cm. longis, 0.1 cm. latis; filamenta libera curvata, antheris aequilonga, antheris inclusis, prope basin dorsifixis, muticis, lobis connatis fere ad apicem, scabridis, albis, demum aureo-brunneis, 0.08 cm. longis, 0.05 cm. latis, poro dimidio lobi aequilongo; ovarium globosum pubescens, 0.05 cm. longum, basin versus 0.07 cm. latum, stylo flexuoso, 0.08 cm. longo, stigmati peltato-crateriformi, 0.08 cm. diam., albo, demum brunneo.

Cape Province: South-Western Region; Riversdale Div., Kampsche Berg, alt. 1200 ft., fl. Jan., *Dr J. Muir*, 2542.

Most nearly allied to *P. tristis*, Bolus. The whiteness of its closely massed flowers gives it a distinct appearance.

Thoracosperma Muirii, L. Guthrie, *T. interrupto* affine, sed ramis prostratis, foliis imbricatis, ovario saepius 4-loculare, ceterisque distinguitur.

Fruticulus humilis, ramis prostratis, ad 20 cm. longis, ad 0.4 cm. diam., ramulis adscendentibus griseo-pubescentibus, ultimis floriferis 1—2 cm. longis; folia erecta vel patentia, 4-nata imbricata obtusa, profunde sulcata, juniora griseo-pubescentia, seniora scaberula; flores solitarii vel plures, apicibus ramulorum dispositi; pedunculi pubescentes,

0.5 cm. longi; bractea solitaria pubescens, pilis longioribus apicem versus, calyci adpressa et aequilonga; calyx pubescens, 0.13 cm. longus, 0.1 cm. diam., lobis lanceolatis, inter se aequalibus, tubo aequilongis; corolla glabra obliqua, basin versus tetragona, superne ampliata, faucibus leviter vel vix constricta, 0.32 cm. longa, ad 0.15 cm. diam., lobis erectis obtusis, 0.05 cm. longis, 0.1 cm. latis; stamina exserta, filamentis filiformibus, 0.33 cm. longis, antheris basifixis, lobis ad basin distinctis, 0.1 cm. longis, aristatis, aristis basalibus brevibus; ovarium ovatum glabrum, immaturum 3—4-angulare, saepius 4-loculare, vel abortione loculis paucioribus, semper 1-ovulatis, stylo gracillimo, 0.5 cm. longo, stigmate simplice, atro-purpureo.

Cape Province: South-Western Region; Riversdale Div., prostrate over exposed rocks on summit of hills at Kanka, fl. April, *Dr J. Muir*, 848.

Allied to *T. interruptum*, N.E.Br., but differs by its prostrate habit of growth, imbricate leaves, and the usually 4-celled ovary.

Thoracosperma radicans, L. Guthrie, *T. Muirii* affine, sed viscidum et ramis saepe radicanibus, bractea spathulata, corolla regulari, ceterisque differt.

Fruticulus diffusus procumbens, ramis gracilibus, saepe radicanibus, ad 30 cm. longis, ad 0.2 cm. diam., ramulis pubescentibus, folia erecta vel patentia, 4-nata vel rarius 3-nata, saepius internodiis aequilonga, oblonga obtusa crassa glabra, minute glanduloso-ciliata, sulcata, 0.2 cm. longa, 0.1 cm. lata; pedunculi pubescentes, 0.05 cm. longi; bractea solitaria spathulata glabra, minute glanduloso-ciliata, calycem aequans vel parum excedens; flores solitarii vel plures, apicibus ramulorum dispositi; calyx obtuse quadrangularis, 0.15 cm. longus, 0.1 cm. diam., lobis ovatis, marginibus revolutis puberulis, nervo medio sat conspicuo, corollae adhaerentibus ob glandulas viscidas, tubo aequilongis; corolla quadrangularis tubiformis purpurea, 0.25 cm. longa, ad 0.1 cm. diam., lobis erectis obtusis brevissimis; stamina exserta, filamentis 0.3 cm. longis, antheris basifixis, 0.12 cm. longis, 0.05 cm. latis, minute aristatis, lobis fere ad basin distinctis; ovarium cylindricum, immaturum quadrangulare, 4-loculare glabrum, 0.08 cm. longum, 0.04 cm. diam., stylo 0.45 cm. longo, stigmate simplice.

Cape Province: South-Western Region; Riversdale Div., alt. 100 ft. fl. April, *Dr J. Muir*, 2405.

Allied to *T. Muirii*, L. Guthrie, but differs by being viscid and in having rooting branches, spathulate bracts, regular corollas, and in other ways.

Gladiolus Muirii, L. Bolus. Cormus elongatus, anguste pyriformis, tunicis exterioribus in permulta capillacea segmenta divisus, interioribus interdum crassis, reliquis foliorum veterum conspicue coronatus, ad 3.5 cm.

longus, 1.8 cm. diam.; caulis gracilis sat rigidus, glaber, cum spica ad 60 cm., saepius circa 40 cm., altus; vaginae immaculatae, inferior 3.5—5 cm. longa, superior ad 15 cm. longa; folia producta 4, anguste linearia, glabra, infimum ad 27 cm. longum, sine vagina ad 27 cm. longa, cetera caulina, gradatim brevioribus, omnia laminam, 2 cm. longam vel ultra, ferentia; spathae valva exterior linearis, acute vel obtuse acuminata, 4.2—3 cm. longa, 0.7—0.6 cm. lata, interior parum brevior, saepe 2-dentata; flores 1—3, perianthio griseo-violaceo vel griseo-lilacino, segmentis inferioribus luteo-notatis, notis eis *G. recurvi* similibus, 3.5—4.5 cm. longo, tubo posteriore ad 1.5 cm., anteriore ad 2 cm., longo, segmentis oblongo-obovatis obtusissimis, superioribus ad 3.2 cm. longis, 1.5 cm. latis, inferioribus lateralibus ad 1 cm. latis, mediano ad 1.4 cm. lato; stamina ad dimidium segmentorum attingentia, stylo ea parum excedente.

Cape Province: South-Western Region; Riversdale Div., *Dr J. Muir*, 1412. Hills at Zoetmelksfontein overlooking Kafir Kuil's River, alt. 800 ft., fl. July 1923, *H. M. Bartlett* (*Dr J. Muir*, 2552).

Very closely allied to *G. recurvus*, Thunb., but differs in the shape of the corm, the rather rigid, "restioid" stem, the unspotted basal sheaths, and by the scent of the flowers, which is that of the sweet-smelling *Babiana plicata*, and not at all of orris-root.

Gladiolus crispulatus, L. Bolus. Cormus ovatus, 1.5 cm. longus, 1 cm. diam., tuniceis tenuibus, in segmenta capillacea divisus; caulis gracilis glaber, cum spica 30—42 cm. altus; vaginae 2.3—5 cm. longae; folia producta 4, linearia glabra gracillima, nunc setacea nunc ad 0.2 cm. lata, infimum, cum vagina 11 cm. longa, ad 48 cm. longum, cetera caulina, 30—3 cm. longa cum vaginis 10—2 cm. longis; spathae valva exterior acuminata crebre tenuissimeque nervata, 3.7—2.5 cm. longa, interior parum brevior, interdum 2-dentata; flores 1—3, fere erectae, perianthio roseo, segmentis lateralibus exterioribus anguste rubro-vittatis, inferioribus nota rubra, oblonga vel lineari, ultra dimidium attingente, ornatis, faucibus lineis rubris interruptis additis, 4.5—5 cm. longo, segmentis crispulatis, exterioribus cuspidatis obtusis, ad 3 cm. longis, 0.8—1.5 cm. latis, interioribus 1—1.7 cm. latis; stamina ad dimidium segmentorum attingentia, stylo cum ramis ea bene excedente.

Cape Province: South-Western Region; Riversdale Div., Corente River Farm, fl. Dec. 1908, *Dr John Muir* (Galpin, 5369); foot of the Langebergen above Corente River, alt. 1200 ft., and slopes of the Langebergen above Witte Els, 2000—2500 ft., fl. Oct.—Nov., *Dr John Muir*, 810.

Gladiolus Louiseae, L. Bolus. Cormus ignotus; caulis gracillimus, cum spica 29—50 cm. altus; vagina una sola visa glabra, ad 8 cm. longa; folia producta 3, linearia, nervo medio marginibusque prominentibus, saepius

quasi totam laminam formantibus, vagina laminaeque sat dense pubescentes, pilis patentibus vel reflexis, brevissimis, folium infimum ad 23 cm. longum cum vagina 7.5 cm. longa, vix 0.15 cm. lata, secundum caulinum, 28—41 cm. longum cum vagina 24—34 cm. longa, tertium sine lamina, spathiforme glabrum, 0.8—1.5 cm. longum; rhachis flexuosa, floribus 2 vel saepius 3, laxè dispositis; spathae valva exterior oblonga obtusissima, crebre nervosa, glabra, 1.5—2.2 cm. longa, interior 1.3—1.9 cm. longa; perianthium dilute purpureo-lilacinum, faucibus aureis, segmentis inferioribus lateralibus medio purpurea macula, 0.4 cm. longa, notatis, infimo nota lanceolata lutea, purpura circumdata, ornato, tubo posteriore 1.5 cm., anteriore 1.3 cm., longo, segmentis exterioribus subacutis, lateralibus 2.2 cm. longis, 1.1 cm. latis, infimo 0.6 cm. lato, interioribus subobtusis, supremo 1.2 cm. lato, lateralibus 0.7 cm. latis; stamina 1.9 cm. longa, parum ultra dimidium segmentorum attingentia; stylum cum ramis 3.3 cm. longum.

Cape Province: South-Western Region; Ceres Div., exact locality unknown. Exhibited at the Cape Town Wild Flower Show, Oct. 6th, 1921. Comm. *Miss Louise Guthrie* (Bolus Herbarium, No. 14195).

Gladiolus Blommesteinii, L. Bolus. Cormus ad 2.5 cm. longus, 1.7 cm. diam., tunicis rigidis crassis, similibus eis *G. gracilis*, vestitus, reliquis setaceis foliorum veterum coronatus; caulis gracillimus glaber, cum spica ad 43 cm. altus; vagina inferior 2.5 cm., superior 4.4—7 cm., longa; folia producta 4, linearia, nervo mediano prominente, marginibus dilatatis, infimum ad 28 cm. longum, sine vagina 22 cm. longa, 0.15 cm. latum, secundum caulinum, lamina 7 cm., vagina 11 cm., longa, lamina tertii quattorque 5—2.5 cm. longa; flores 1—4, saepius solitarii, adscendentes; spathae valva exterior crebre nervosa acuta, 2.3—3.2 cm. longa, interior obtusa 1.8—2.2 cm. longa; perianthium dilute lilacinum, segmentis inferioribus ultra dimidium luteis, lineis interruptis roseo-purpureis notatis, tubo posteriore 1.5 cm., anteriore 1.9 cm., longo, segmentis 2—3.5 cm. longis, 1—1.9 cm. latis; stamina 1.8 cm. longa, dimidium segmentorum attingentia, stylum ea parum excedens.

Var. β , major. Perianthium explanatum ad 6 cm. longum, pallidum, segmentis cuspidatis, angustioribus pro longitudine.

Cape Province: South-Western Region; Caledon Div., Elgin, fl. Sept., *G. van Blommestein* (Bolus Herbarium, No. 15202). Exhibited at the Caledon Wild Flower Show, Sept. (Bolus Herbarium, Nos. 14786, 14790, 16912). Var. β , Caledon Wild Flower Show, Sept. (*id.* 14791).

Eucomis Pillansii, L. Guthrie, *E. nanæ* affinis, sed foliis brevioribus, latius spathulatis, humi arcte adpressis, pedunculo racemoque minoribus, differt.

Bulbus circa 12.5 cm. longa, 7.5 cm. diam.; folia 7—8, obovato-

diametroque, floribus sessilibus; coma e foliis circa 30, lanceolatis acutis subundulatis, marginibus purpureis membranaceis, composita; perianthii segmenta oblonga obtusissima viridia, interdum purpureo-notata, 1.25 cm. longa; stamina stylo incurvata, 0.6 cm. longa, filamentis lanceolatis; ovarium obovatum, 0.5 cm. longum, 0.6 cm. diam., stylo 0.3 cm. longo.

Cape Province: Western Region; Namaqualand, Bowesdorp, N. S. Pillans (Bolos Herbarium, No. 16633).

Allied to *E. nana*, Ait., but differs in having shorter and more broadly spathulate leaves, pressed closely to the ground, and a smaller peduncle and raceme.

Described from a living specimen which flowered in Mr N. S. Pillans' garden, Rosebank, near Cape Town, August 1920.

EXPLANATION OF PLATES

PLATE VII.

- A. *Erica fontana*, L. Bolus. B. *Erica Nevillei*, L. Bolus. C. *Erica limosa*, L. Bolus. D. *Erica quadrisulcata*, L. Bolus. E. *Erica paludicola*, L. Bolus.
A, B, C, D, E. Fig. 1, node; 2, leaf; 3, flower; 4, bracts and calyx; 5, sepal; 6, corolla; 7, anther, side view; 8, anther, back view; 8a, anther, front view; 9, gynaeceum—variously enlarged.

PLATE VIII.

- A. *Erica saxatilis*, L. Bolus. B. *Erica cincta*, L. Bolus. C. *Erica montana*, L. Bolus. D. *Erica coruscans*, L. Bolus. E. *Erica coruscans*, L. Bolus, var. *minor*. F. *Erica utriculosa*, L. Bolus.
A, B, C, D, E, F. Fig. 1, node; 2, leaf, back view; 2a, leaf, front view; 3, flower; 4, bracts and calyx; 5, sepal; 6, corolla; 7, anther, side view; 8, anther, back view; 8a, anther, front view; 9, gynaeceum.

PLATE IX.

- A. *Erica fervida*, L. Bolus. B. *Erica autumnalis*, L. Bolus. C. *Erica annectens*, Guthrie and Bolus. D. *Erica Eylesii*, L. Bolus. E. *Erica Duthieae*, L. Bolus.
A, B, C, D, E. Fig. 1, node; 2, leaf; 3, flower; 4, bracts and calyx; 5, sepal; 6, corolla; 7, anther, side view; 8, anther, back view; 9, gynaeceum.

ERRATA.

Page 73, for Pl. III, D. read Pl. III, E.

Plate III. For D. *Erica Eustacei*, L. Bolus read D. *Erica brachysepala*, Guthrie and Bolus; and for E. *Erica brachysepala*, Guthrie and Bolus read E. *Erica Eustacei*, L. Bolus.



A. *Erica fontana*, L. Bolus.
 C. *Erica limosa*, L. Bolus.
 E. *Erica paludicola*, L. Bolus.

B. *Erica Nevillei*, L. Bolus.
 D. *Erica quadrisulcata*, L. Bolus.



A. *Erica saxatilis*, L. Bolus.

C. *Erica montana*, L. Bolus.

E. *Erica coruscans*, L. Bolus, var. *minor*.

B. *Erica cincta*, L. Bolus.

D. *Erica coruscans*, L. Bolus.

F. *Erica utriculosa*, L. Bolus.



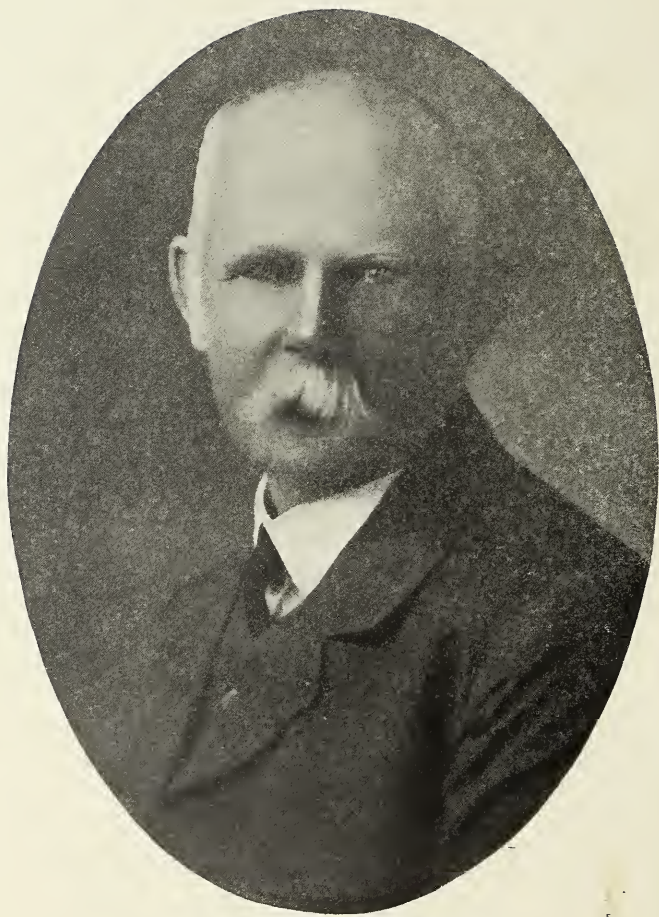
A. *Erica fervida*, L. Bolus.

C. *Erica annectens*, Guthrie and Bolus.

F. *Erica Duthieae* L. Bolus.

B. *Erica autumnalis*, L. Bolus.

D. *Erica Eylesii*, L. Bolus.



H. G. Flanagan, F.L.S. (1861-1919)

1861
VI
18
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H. G. FLANAGAN, F.L.S.

HENRY G. FLANAGAN was born at Komgha, a small town in the native territories in the Eastern Districts of the Cape Province, on January 22, 1861, and died on October 23, 1919, at the Grey Hospital, King Williamstown. He was educated at the Public School, Komgha, and early in his career became the owner of Prospect Farm, in the Komgha Division. In 1890 he married Florence Reynolds who, throughout the remainder of his life, shared her husband's labours and hobbies with unlimited devotion. In 1898 Flanagan was elected a Fellow of the Linnaean Society.

For years before this, and in the midst of the multitudinous calls made upon the time of a practical farmer, he had set himself to collect the native plants of his district, a task he performed with characteristic thoroughness. No pains were spared in order to ensure success. I have heard how it was his custom to take an oil-stove with him to the sea-side, expressly for the purpose of rapidly drying in the oven certain plants which would otherwise have been spoilt by weather conditions. To-day his carefully selected and well-prepared specimens are in some of the largest herbaria of the world. His own valuable collection, containing all the types of his many discoveries, is now an important part of the National Herbarium in Pretoria, to which institution it was bequeathed.

Mr Flanagan's first collections were sent to Dr Peter MacOwan, at that time Government Botanist in Cape Town, who with the experience of advanced years immediately recognised "a promising collector," and set himself to give that help and encouragement which are of such vital importance to the beginner.

Besides collecting in the Komgha Division, Mr Flanagan made some extensive journeys for the purpose of botanical exploration. Among these were several to Rhodesia and the memorable waggon-journey in 1895-96, when he was accompanied by his wife and by his friend, the late Dr Harry Bolus, through Pondoland to the Orange Free State, culminating in the ascent of the Mont-aux-Sources. This trip yielded many novelties to the trio—some of the more notable being *Zaluzianskya Flanaganii*, Hiern, found on the summit (9100 ft.), and *Erica Flanaganii*, Bolus, on the landward slopes of the Mont-aux-Sources (8000 ft.); and the beautiful Balsam, *Impatiens Flanaganiae*, Hook. f., at Port St John.

During the last twelve years or more of his life Mr Flanagan's attention was chiefly turned to the development of his beautiful garden, containing

many rare exotics as well as South African trees, shrubs and succulents. It would be impossible to estimate the delight and comfort he must have derived from this pursuit, especially when one remembers that he suffered continually from headaches, and that there were periods lasting for days when he was prostrated by severe attacks of this painful malady.

Of a modest and retiring disposition H. G. Flanagan was, nevertheless, one of the leading farmers of his day, and it is most gratifying to record that he lived to reap some of the reward of his strenuous labour and undaunted perseverance; for during the latter part of his life the name of Flanagan Brothers and their famous citrus farm were known all over South Africa.

H. M. L. B.

